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TODAY

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Basic Computer Care

Getting the Most Out of VisiCalc

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"GO HTH-1" – The Heathkit catalog is now online.

If you've thought of ordering a Heathkit product but somehow never got around to it, here's some important news.

As a subscriber to CompuServe you have the world at your fingertips. Now you also have the world of kitbuilding available with the new Heathkit online catalog. Come and browse – you'll find an easy to use menu-driven system with 17 different product categories that make up the over 400 electronic kits you can build yourself. Take advantage of our specials and bargains. You can even place your order using your Visa or MasterCard.

Some of our kits are on the leading edge of technology, like the H-100 computer shown here. The Heathkit H-100 features dual 8-bit & 16-bit microprocessors, memory up to 768K, high resolution graphics (color optional) and high capacity disk storage.

On the other hand, many of our kits are quite basic & quick to complete. If you or your family are involved in cars, boats, amateur radio, alternative energy, woodworking, even weather, we have a kit for you. Build television receivers and audio components among the finest in the world. Or all kinds of advanced products for your home.

You'll have the satisfaction that comes with knowing you have built a really fine product that is uniquely yours. We provide the best components and instructions. You contribute the care and skill. The result is workmanship in which we can both take pride.

Come browse the Heathkit online catalog – just type GO HTH-1 at any ! prompt. Discover, like millions of satisfied customers, the pride and satisfaction that goes with saying "I built it myself!"

```
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 2. Bargains                  12. Marine
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 5. Clocks                    15. Security
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 7. Education Courses         17. Television
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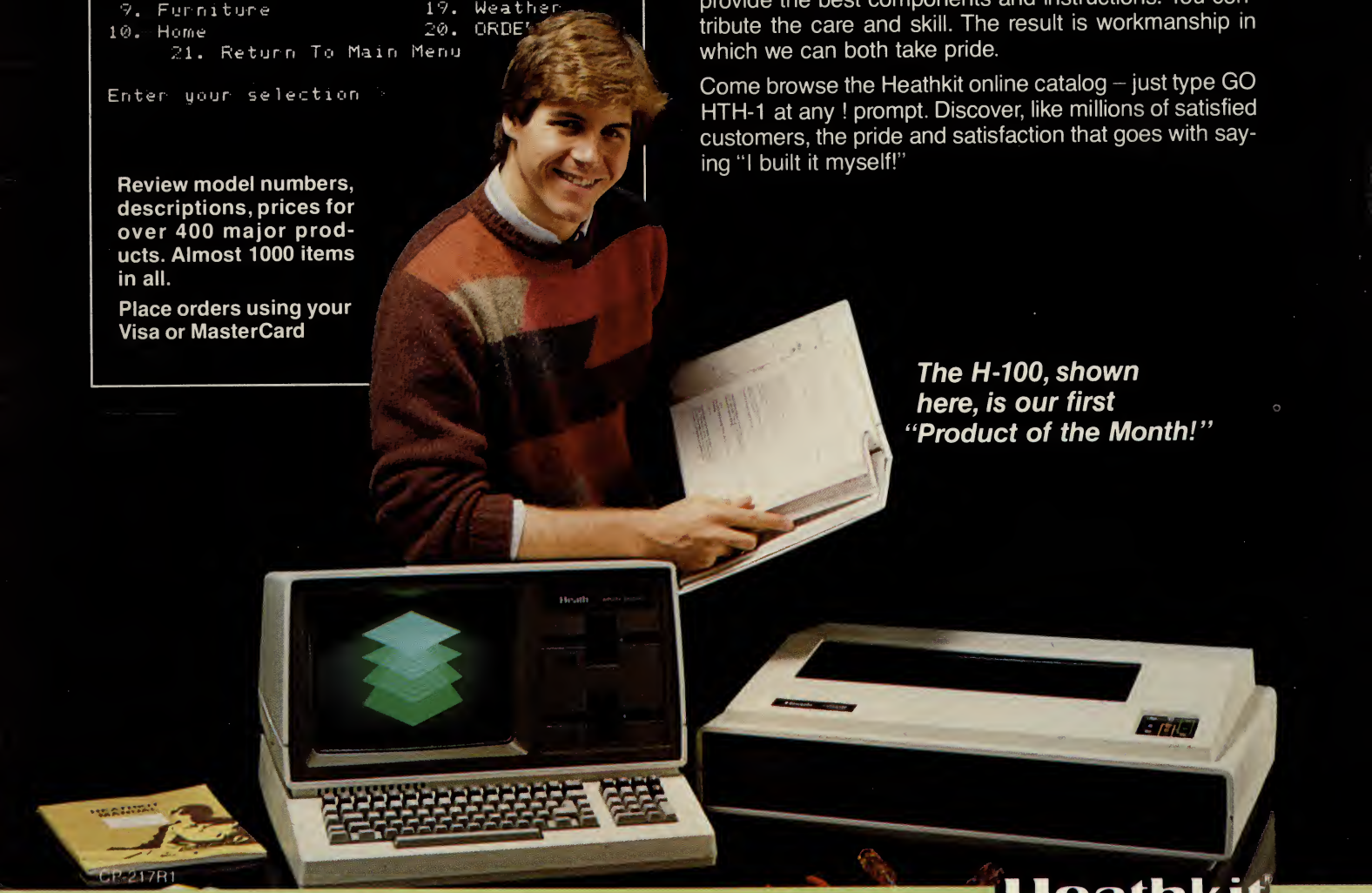

The H-100, shown here, is our first "Product of the Month!"

CR-217R1

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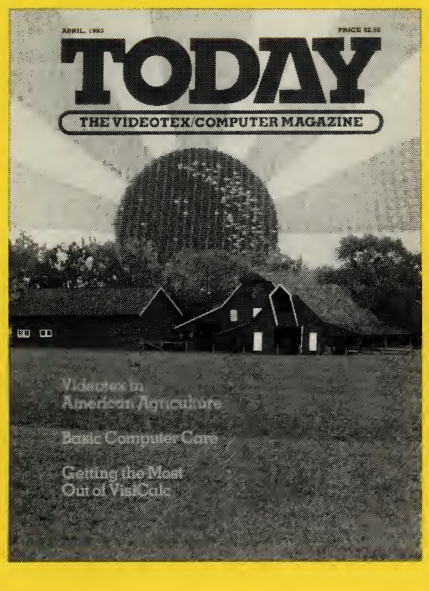
TODAY

THE VIDEOTEX\COMPUTER MAGAZINE

SPECIAL REPORT	**12**	**American Farmers: Pioneers in Videotex** *From the small, regional Farm Bureau experiments in the 70s to the large commercial networks of today, American farmers have had an important part in videotex development and application. This five-part report traces the development, problems, impact and potential of agricultural videotex and stand-alone computing.*
FUTURE	**20**	**An American Megafarmer** *A story about two farmers who confront computer technology in 1995.*
HOME	**24**	**Taking Care of Your Computer** *Find out how to avoid some common pitfalls that await recreational, business and professional computer users who ignore basic and easily-accomplished preventative maintenance procedures.*
TECHNICAL/TUTORIAL	**32**	**Getting the Most Out of VisiCalc** *Of all the testimonials to VisiCalc, the most persuasive is the continuing series of discoveries of novel new uses and applications of this most versatile program. This tutorial provides some tips on how to greatly expand the pleasures of using VisiCalc.*
REVIEWS	**36**	**Software** *Zardax word processing program*
	40	**Books** *Basic Faster and Better and Other Mysteries* *Create Word Puzzles With Your Microcomputer*



Cover
"High Tech Farm"
TODAY looks at the role of videotex and microcomputing in American agriculture.

Computer graphics by John Losco

INDUSTRY WATCH

43 **New Product Announcements**
TODAY keeps you abreast of the latest developments in hardware, software and computer communications technology.

DEPARTMENTS

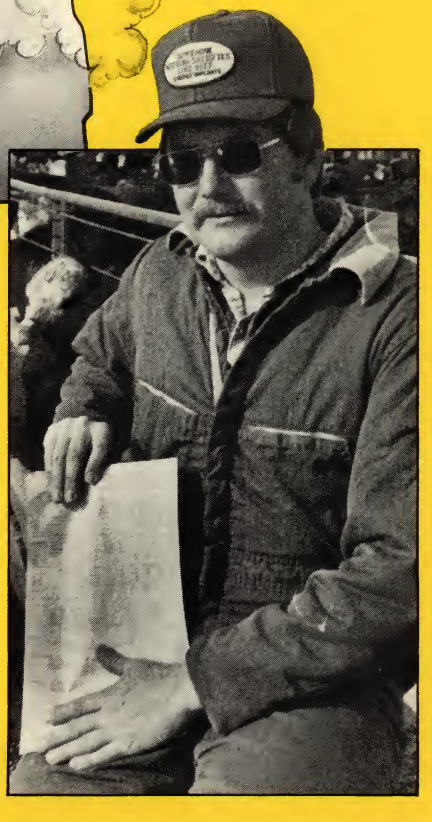
4 **Letters**

9 **Dear Reader**

10 **View on Videotex**
With R.C. Morse

Computer Care
See page 24

Farmers & Videotex
See page 12



Grassroots Graphics
See page 19

Letters

Software Piracy

Your article on "Software: Creators and Crooks Play Hardball" summarized the uniform frustration and confusion of creators and owners of software, particularly of mass-marketed (consumer) software. Owners of larger, commercial programs can utilize a combination of trade secret and copyright law in an attempt to stop would-be pirates. And with higher cost software, the large legal costs associated with prosecution of pirates is more easily justified. Moreover, the purchasers of printed copies of large commercial programs are taking higher risks associated with lack of support from the real owner.

Until the laws for protection of software are improved, the copyright laws remain standard. Recent case law has reinforced the usefulness of copyright law. But, of course, one has to identify the pirate before suit can be filed and unless the pirate is a wholesale copier, the potential recovery might not justify the cost. This is very similar to the problems of authors of educational and technical literature whose publications are routinely photocopied.

Recently, the Association of American Publishers coordinated a suit against teachers and universities who allegedly copied copyrighted material without compensating the authors. Other cases brought by publishers have been settled out of court, with the defendant usually agreeing to pay owners on a per copy basis. Perhaps an association of software creators would be useful in representing the creators against small, medium and wholesale pirates.

In passing, I would like to clarify a point in the article: A copyright need not be registered, though registration provides more benefits. Finally, I suppose it is little consolation, but creators should know that some of the most quickly broken programs have been the copy programs.

Barry S. Bissell
Patent and Licensing Officer
Battelle Development Corporation
Columbus, Oh.

I enjoyed reading the January/February issue of TODAY. The article entitled "Software: Creators and Crooks Play Hardball," by Kaye Hohmann, was very interesting to me since I am a licensed Private Investigator and consultant. I deal with proprietary right violations such as copyright, patent and trademark infringement — especially within the computer industry.

Even though the article clearly points out that piracy does occur and is quite profitable, it also cites one particular case, MicroPro and Digital research vs. Data Equipment Corporation. It should be noted that even though the settlement called for Data Equipment Corporation to pay $250,000 in legal expenses and the chairman of DEC to personally pay $30,000 to MicroPro and Digital Research, such payments seldom occur. It is my experience that the majority of defendants in piracy cases actually do not have "substantial assets" that would be available for collection should judgement be rendered.

Dennis W. Hettman
Eugene, Oreg.

continued on page 6

Electronic Bounce Back

Instructions/Tips

STEP 1. Enter Electronic Bounce Back through User Information item #11 or Go EBB-1. Once you are familiar with this service you may wish to save time and skip the introductory pages by going directly to EBB-4 (Go EBB-4).

STEP 2. At the EBB menu, select either item #1 to receive an index of advertisers or item #2 to go directly to the ordering section.

STEP 3a. Selection of item #1 will display a list of issue dates from which to choose.

— Once you have identified an issue date, you will be presented with an alphabetic listing of advertisers unique to that issue.

— you may wish to review the entire list of advertisers or you can interrupt the list by typing Go EBB-4 at the end of any page. This "Go" command will return you to the information ordering page.

STEP 3b. Selection of item #2, on page EBB-4 (step 2) will prompt as follows:

Enter Advertiser(s) names(s)
>

If requesting information from more than one advertiser, separate their names with commas, i.e. Company A, Company B. By doing so, you will not have to reenter your name and address for multiple advertisers. **NOTE: Be sure to enter advertisers' names, NOT product names.**

Enter month in which ad(s) appear
>
Enter your name
>
Enter your street address
>
Enter your zip code
>
Enter comments or questions up to a maximum of 3 lines of 132 characters per line

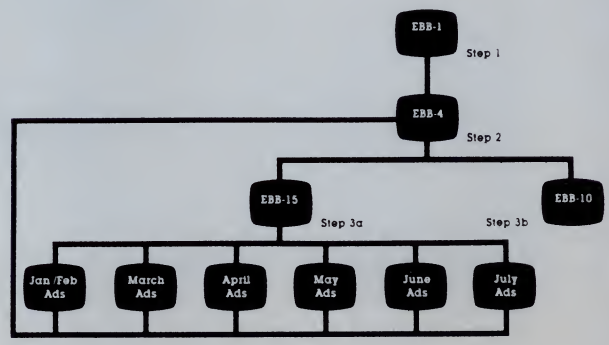
>
>
>

This is your opportunity to specify the nature of your inquiry. Keep in mind you will be communicating directly to the advertiser and not to TODAY magazine or an independent clearing house.

If you do not wish to enter a special message, simply key ⟨ENTER⟩ at each of the three > prompts.

NOTE: These comments will be received by all advertisers listed above. To make specific comments unique to multiple advertisers, simply repeat Step 3b.

After completing your request, you are returned to Step 2.



Electronic Bounce Back puts you into direct contact with our advertisers.

When you respond to an ad in TODAY Magazine, you're "talking" directly to the advertiser. This means an end to the weeks of delay it takes for an ordinary reader service card to reach an advertiser (not to mention the additional time lapse for an advertiser to answer your inquiry once it is received).

EBB not only lets you respond to an ad with the usual name and address information, but it also allows you to ask for specific information, leave additional comments or in some cases even order a product. The advertiser in turn can reply, if so desired, through our electronic mail system, Email™.

TODAY is the first magazine to develop an "electronic" reader service and take advantage of the 2-way communications capabilities available through the use of videotex technology.

Electronic Bounce Back is easy to use. Just GO-EBB and follow the prompts. EBB will allow you to review an index of advertisers or go directly to the ordering section. Users of EBB will be able to request information from present advertisers in each issue of TODAY as well as from advertisers in past issues.

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Letters

Micro Miracles

I thoroughly enjoyed TODAY's special section "Micro Miracles for the Handicapped" in the March issue. I am slowly losing my eyesight to a retinal disorder, and I will eventually be completely blind. The article about Georgia Griffith and David Plumlee gave me immense hope and encouragement. No longer do the blind and handicapped have to be cut off from the world with the advent of such technological wonders as the VersaBraille, the Optacon and synthesized speech terminals.

Thank you for a wonderful article!

Alan Shindler
Atlanta, Ga.

Educational Networks

I read with interest the comments on educational networks in the March TODAY. While Dick Ricketts' comments are well taken, I must point out that many of the obstacles to growth he cited are actually the benefits usually associated with using videotex systems and networks.

True, conversing by computer must compete with conversing face to face, but communicating by computer has many benefits that face to face communicating does not, such as having a typed transcript of the conversation which can be referenced at a later time, or conversing with dozens of people simultaneously.

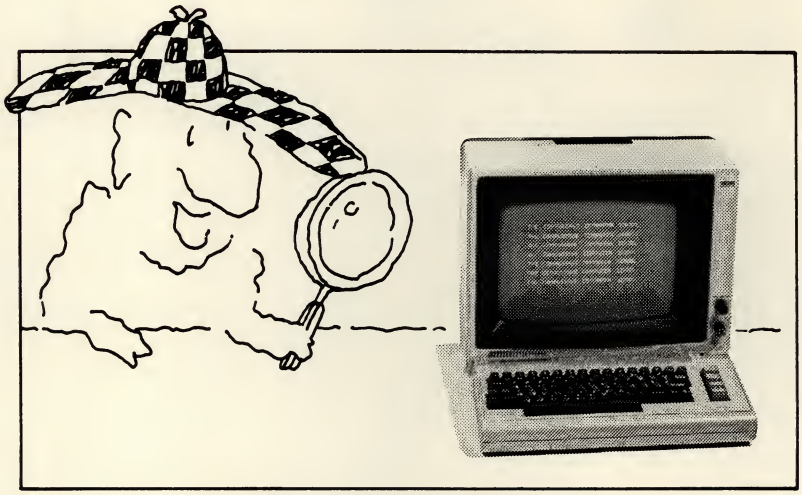
Networks also put people in touch with each other regardless of geographic location, and when you consider most networks cost pennies per connect minute, an hour long conversation between New York and Los Angeles by computer will beat a traditional voice phone call every time.

Marilyn Marre
Berkeley, Calif.

Timex Sinclair Tutorial

In the March issue of TODAY, the tutorial "Learning the Timex Sinclair 1000/ZX81 Keyboard" contained a keyboard entry practice program. Some important graphic symbols were dropped out during typesetting of the chart. Here is how the listing should appear:

Ah-ha!



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```
  10 PRINT " [illegible] ?=
";
  20 INPUT A
  30 PRINT A
  40 IF A<=0 THEN GOTO 100
  50 LET X=SQR A
  60 PRINT TAB 2;"▒ SQUARE ROOT
▒ = ";X
  70 PRINT "----------------------
----------"
  80 GOTO 10
 100 PRINT AT 21,10;"▚▚ END ▚▚
"
```

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8″ DSDD Soft Sector (Unformatted)	**3102**	3.34
8″ DSDD Soft Sector (128 B/S, 26 Sectors)	**3115**	3.34
8″ DSDD Soft Sector (256 B/S, 26 Sectors)	**3103**	3.34
8″ DSDD Soft Sector (512 B/S, 15 Sectors)	**3114**	3.34
8″ DSDD Soft Sector (1024 B/S, 8 Sectors)	**3104**	3.34
5¼″ SSDD Soft Sector w/Hub Ring	**3481**	2.34
5¼″ SSDD 10 Hard Sector w/Hub Ring	**3483**	2.34
5¼″ SSDD 16 Hard Sector w/Hub Ring	**3485**	2.34
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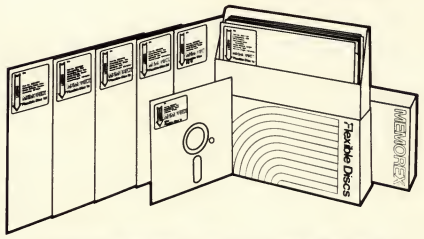

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Dear Reader,

When many people think of videotex the flashy urban-bound experiments most often come to mind. Although these types of "closed" experiments receive the most media attention, the practical applications seem mutable, at best.

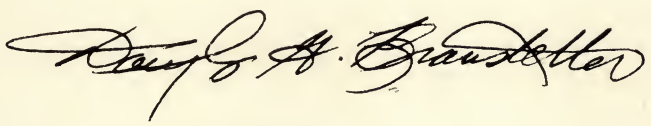
Some of us might be surprised to know that the earliest videotex and teletext experiments were conducted in rural areas for the benefit of that classic American pioneer, the farmer. The potential and practical applications are clear: Well-rounded agricultural videotex services can increase farm efficiency and productivity. In some cases, the financial difference made by some timely information can literally save a teetering farm operation from the auction block.

To today's farmer, who is used to dealing with yearly operating expenses that can easily run into six figures, a terminal or a microcomputer and modem are a relatively small investment. The returns can be substantial. Farmers who participated in American Farm Bureau videotex experiments in 1981-82 reported returns of up to $17,000 in the first year alone. Most of the savings were attributable to fast and accurate market and weather information.

Clearly, the advantages afforded the farmer by a micro and videotex service are worth the trouble it will take to overcome the problems that exist. Extra effort must be made to link the information providers with the information-needers. More specific information, tailored to each type of farmer — whether grain, produce, or livestock — will have to be funneled electronically to the appropriate place. Network services will have to be improved to rural areas and more effort made to educate farmers about how to use the networks to full advantage. Perhaps an undertaking of this magnitude will call for the cooperation of national and local government, the information providers and gatherers, and existing network services.

In some areas that are lacking, farmers are helping themselves. Notoriously bad "canned" farm software can be rejected in favor of custom-designed programs written by experienced farmers like Lornie Mattix (see page 17) and Neale Bartter (page 18). As more agribusiness people like Lornie and Neale are introduced to the New Technology, more operation-specific software and videotex services can be created.

In the final analysis, American agriculture's technological progress can only mean good things for the farmer as well as the consumer. It would seem that the American farmer's pioneer spirit will help him make the most of the Information Age.



Douglas G. Branstetter
Editor

R.C. Morse

VIDEOTEX: Birth of An Industry That Will Change the Way We Live

Videotex. You've seen the word, and maybe know something about it. But chances are it's still pretty much of a mystery for you. It's not yet a part of your everyday life although you know it will be for your children.

Videotex holds the potential to greatly affect and change the way we live. It will allow for cottage industries to grow and take hold in an Information Revolution that many perceive to hold as much significance as the Industrial Revolution. Indeed, as our own country shifts from a manufacturing-based to a service-based economy, the role of Information Technology — or IT as it's referred to in Great Britain — can only serve as a foundation on which business and industry will be built in the future. That we will have the option of working from our homes — whether we actually do or not — is enough to demonstrate the impact such technology will have on social organization and lifestyles.

Science fiction enthusiasts and others are likely to conjure up visions of a nation of hermits, never leaving their homes, mindless slaves to a keyboard, modem, and TV or PC for all forms of human interaction. Much more likely to occur is a society in which the PC/videotex unit becomes an integral part of everyday life as a necessary appliance.

Promising as all this sounds, and real as it already is on CompuServe and other services, you might be wondering where it all came from and how it got here.

Technically, it goes back to the late 1960s in this country, when companies started building databases with newly-available computers. A number of ASCII-based systems developed from there — primarily specialized business networks, and later commercial database services such as CompuServe. Unlike ASCII systems, "true" videotex combines text with graphics and color. In Europe, ASCII systems aren't really considered to be videotex in its true form because ASCII can't provide graphics or color.

A number of different systems have become available over the last dozen years, offering a variety of graphic display capabilities — from tile-like mosaics to the digital equivalent of still video.

In 1970 the British Post Office Laboratories, which then controlled the country's telephone operations, were trying to figure out a way to make use of some of the research from the British picturephone project. Like Ma Bell, the British found the sophisticated, elaborate picturephone technology was not viable in a commercial environment, simply because of its projected cost. Like Ma Bell, the British abandoned the project, but from its ashes came the birth of videotex, or viewdata as it was originally called.

The initial plan behind picturephone service was to establish a separate wire network capable of handling the larger volume of pictures over voice or data transmissions. Originally, this network would have been connected to centralized video display units (VDUs) that would have carried pictures as well as data. Hence the name—viewdata. With the picturephone network idea scrapped, data could still be sent — only now it would have to be to local VDUs over the existing telephone network, producing extra revenues from the network already in place. That was the goal set for a new group established in 1970 at the Post Office Laboratories, today known as British Telecom Laboratories.

Sam Fedida was brought in to salvage the viewdata portion of the picturephone project, and he assembled a staff of less than a dozen to work with him in computer applications.

"What can you do lads?" Fedida is reported to have said to his newly assembled group of young colleagues, as if to challenge and fire their imaginations as well as their abilities. As the group began to mull over the question, Fedida hit upon a simple notion. The way he put it in a recent conversation, "I was annoyed computers were so dumb, that you had to learn their language to communicate with them. I began to think why shouldn't computers be made easy to operate, that software be written to make their operation simple for anyone. It was then I conceived of a machine designed for people, not the other way around."

It was this concept — making computers easy to use — that served as a catalyst for the computer applications group to begin work, and the notion that earned Fedida the distinction of being the father of videotex.

It was actually the heart of the picturephone system that served as still another part of videotex's birth — the VDUs or video display units used to project an image onto a screen. Slowly, as the group progressed, an idea began to emerge that unified the concepts of easily-operated computers and extended phone service with the guts of the picturephone imbroglio, the VDU. What Fedida and his group arrived at was an easily-accessed computerized database available to consumers in their homes or businesses through the already existing telephone network, with its display over a modified VDU monitor, and later an adapted TV.

According to Fedida, it took two years to arrive at that idea, but once conceived in 1972, work sped full steam ahead. Two years after that, and after much experimentation, a demonstration system was mounted. A public demonstration followed, in 1975, in London. It was at that point a public service videotex system was conceived, and the name given it was Prestel. A pilot service started up the following year, in 1976, with full scale service introduced by 1979. In November 1981, the service was first made available in the U.S.

Today Prestel has over 20,000 subscribers worldwide, and is run by the recently-privitized British Telecom, which acts as a service provider leasing portions of its quarter of a million page database to over 1,000 information providers (IPs). Originally seen as a consumer medium, the technology was initially far ahead of its marketplace, and residential use of Prestel has been slow in building. Of the current subscribers, only about 15 percent are residential users, the vast majority being businesses. Travel agents, for example, use the system to make airline and hotel reservations both in the U.K. and elsewhere around the world.

Other databases include stock and commodity listings in the U.K., Europe, U.S., and Far East; economic indicators for the world's industrialized nations; up-to-the-minute reports and listings of ships' positions at sea, contracts awarded in various trades such as building and construction; as well as news, sports, weather; games; teleshopping and messaging facilities; and private closed user groups (CUGs), primarily for businesses' internal communications needs.

But the commercial market is still seen as the principal target for videotex implementation. And a number of recent developments indicate that British Telecom is ready to try again for this market in the U.K., this time in conjunction with banking organizations, the Nottingham Building Society and Bank of Scotland. Homelink, as the new service is called, was introduced in January 1983. Homelink users are able to view account statements and transfer money between accounts, pay household bills, buy a range of consumer goods and services, send and receive electronic mail, and have access to the Prestel system as well.

Now in phase one, which lasts until June, several thousand professional firms, with balances of 10,000 pounds (about $16,500) on account, will receive free terminals. The eventual goal is to supply all customers with consoles on a loan basis. Within the next few years, officials believe some 100,000 households will be on line.

Real time telebanking and teleshopping are only possible through what is know as gateway technology. This allows a videotex host computer to interface with another, remote computer, and to interact with its database in what is perceived by the user as a transparent system. The technology is a product of German videotex development, which we'll look at, along with French, Canadian, and other videotex development throughout the world.

Internationally Syndicated Information Services/ISIS

ISIS is a new company formed this year by new electronic media journalist and consultant R. C. Morse. For many years, Morse has been supplying new electronic media stories and reports to a number of trade and consumer magazines, as well as providing consulting services to companies and organizations involved in videotex. His stories have been published in such trade magazines as *Advertising Age, Cable Marketing, Editor & Publisher, International Videotex Teletext News,* and *Marketing Communications;* consumer publications such as *Ms.* and *Museum.* Prior to forming ISIS, Morse served as a marketing consultant for British Videotex and Teletext, the marketing arm for British industry in the U.S.

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STOCKCRAFT

American Farmers:

PIONEERS IN VIDEOTEX

by Kathy Bissell

In the 1850's when most Americans lived on farms, each farmer produced enough food for five people. In the 1980s, only 4 percent of Americans live on farms, and each farmer produces enough food for 60 people.

In 1930, there were still 6.5 million farms in the U.S.; today, there are but 2.3 million. The number is growing smaller each year.

Since 1945, while acreage of the average farm has slightly more than doubled, costs for running a farm have gone up 20 times. Clearly, the American farmer is producing more, for more people, on fewer farms, with less labor, under the strain of greater operating costs.

Sometimes the costs of farm production are so great and the risks of farming so high that together, they can drive farmers off the land. Skyrocketing interest rates of recent years have crippled many farm operations because farmers have to borrow heavily each year in order to pay operating costs — fertilizer, pesticides, seed, equipment.

Computer networks, however, are helping. They are changing the core of American agriculture. "Twenty years ago," says Ohio farmer Don Smith, "nobody sold anything (grain crops) ahead. When it was time to buy school clothes, farmers took a load of corn to the elevator and sold it. Now (January 1983) I've sold corn for delivery in March of 1984." Smith, who farms 1,000 acres and raises 800 head of hogs near Eaton, Ohio, feels the computer is an essential ingredient in the farm picture today. "The most important part is that agriculture today is a tremendously large business, dealing with a great deal of money. The information we have and the timeliness of the information is very important."

Smith, like thousands of other farm business owners in the '80s has come to rely on information from the growing number of farm videotex services that have sprouted in rural locations such as Kentucky, Michigan, Nebraska, Wisconsin and Manitoba, blanketing North America with agricultural data to help today's farmer stay profitable. Smith is linked to the Ohio Farm Bureau Federation network called ACRES, an outgrowth of a pilot program of the American Farm Bureau that involved eight states: Ohio, Michigan, Illinois, Iowa, Arkansas, Georgia and South Carolina.

The pilot program, according to Rob Boyson of the American Farm Bu-

reau's American Agricultural Communications Systems, Inc., was designed "to serve the communication and information needs of national, state and country Farm Bureaus, as well as individual Farm Bureau members." The test program began in 1981 and ran through July of 1982, but according to Boyson, "The American Farm Bureau began researching this idea as far back as 1976. We had a commercial planning group analyze the demand by our members. While that was happening, the microcomputers were also being developed. As a result, the consultants suggested videotex as a delivery system (for agricultural information)."

Commercial operation

Having finished the test phase in several states, the American Farm Bureau is focusing on putting information into the system. "We are negotiating with various suppliers," Boyson says. He hopes the network will be able to link together the nation's three million Farm Bureau members. "One of the real opportunities is to utilize information from members in different parts of the country. They'll have the ability to put information into the system that other people in other parts of the country want to access." Or, like Don Smith, farmers will be able to get in touch with grain dealers who want to buy.

Individual states in the pilot program reported mixed results, although most were pleased with the overall idea. On the plus side, according to Alan Brugler of the Ohio Farm Bureau, are the results in Ohio, where the test has now gone into the commercial phase of operation. "We presently have 650 items in databases. Futures (prices for farm products) are updated every ten minutes. Having access on a demand basis evens up the information balance. It evens up the overpay, underpayment situation for crops." In the Ohio test, 25 farmers participated with equipment provided by the Farm Bureau. Farmers reported that they made $1,200 to $17,000 that they wouldn't have made otherwise, according to Brugler, by participating in the pilot program.

In Michigan, Bob Craig of the Michigan Farm Bureau reports that 90 percent of those who used the Farm Bureau program suggested it be expanded on a commercial basis for Farm Bureau members. Though they too had 25 farmers in test period, 50 subscribers have now joined the commercial version. "From what we know," Craig says, "no more than 100 (farmers) in the state have computers." Their goal is to reach 200 subscribers by next fall.

Of the 60 menu items in the Michigan test, farmers most often touched in to get information on futures, market advice and analysis, cash prices for farm products, weather and Farm Bureau legislative reports from lobbyists in Lansing and Washington, D.C. The few problems in Michigan came from fruit and vegetable growers who found there was not enough information for their needs, especailly compared with that for livestock, dairy and grain farming operations. "They are different markets," says Craig of the problem. "The nature of markets is different. Fruits are perishable. Some cannot be stored." Phone access was also a problem. The Michigan Farm Bureau will now offer a toll-free phone service as an option in it's product line-up. "One reason we provided grain and livestock advice," Craig adds, "is that we have an excellent source with AgriVisor at The Illinois Farm Bureau."

Problems

Six of the eight states in the pilot program got market advice from Illinois. Merold Yates of the Illinois Farm Bureau in Bloomington says they have still not decided whether to proceed with the program in the same fashion as other states such as Ohio and Michigan. However, this is because Illinois Farm Bureau has broadcast agricultural advice to farmers all over the state for eight years, using other means.

"In 1975, we began to provide our market advisory service with a taped message giving price information, market news and marketing advice," Yates said. It was distributed via WATS lines. A biweekly newsletter and seminars completed the information package. "In 1977 we began experimenting with a system sort of like Muzak," he explains. "Information was updated 15 or 16 times a day. We provide a special noon program, which was almost live. Then, two years ago, we discovered we could send digital data on radio subcarriers that could come out in video form. We distribute it to radio stations on satellite." Yates says the farmers have special equipment, FM receivers, a modem (1200 baud)— one way, and a computer terminal. "It's called StrataVisor." The broadcast is continuous and the service now extends to the northern one third of the state, or from Bloomington to Chicago. The market information, which in Illinois is on tape, radio or via computer, was exported to other states for the pilot program.

Yates says the farmers in Illinois were not as enthusiastic about the pilot program as those in other states, because they had been receiving information already, although in another form." We are not representative of other states because we were operating another system at the same time. People who were already AgriVisor subscribers were accustomed to getting the information via cheaper methods. We had problems with phone lines. People were unable to get

good connections. There are groups of farmers in Illinois who have phone lines that will not ever be good enough to hook up to a computer. Others have to call three or four times to get a connection." Those not familiar with telephone conditions in rural America may not be familiar with the party line system, where several families use the same telephone line. If one family picked up the phone while another family was using the line for the computer, the computer would drop the connection or the signal would be garbled because of the additional noise.

On the positive side, Yates says "People loved the information. Some people liked to have it to read. However, they did not like the inconvenience of an ID number, a request number and the fact that they had to make a phone call and wait for their information." With the earlier Illinois systems, the information is continous. Farmers could listen more than once. Yates says some even tape record it. As for the phone line problems, "When they put in systems, nobody dreamed we'd be sending data."

AGNET and TELFARM

The University of Nebraska has a program about the same age as the one developed by the Illinois Farm Bureau Federation, but they've approached the communications part in a different way. In Illinois the Farm Bureau has used radio, satellite, and phone lines, audio transmission, video transmission and now videotex, while in Nebraska the thrust has been to computerize from the start.

"In 1975 we became an official agency," says Pat Ebmeier of AGNET, the Nebraska-born videotex service. "It all started because a couple of professors here tended to use computers for classroom work. They wanted to train the computers to understand students instead of vice versa." By late in 1977 a program was developed for Nebraska and for neighboring states whose land grant universities also participated in the project. Included in the AGNET fold are Montana, North Dakota, South Dakota, Wyoming, and Washington, which joined in 1980.

In its initial stages, farmers had to go to visit their cooperative extension office. There, they would sit down with an extension specialist and work through the problem solving programs together. "In 1978 it became more official. Dumb terminals were used first," according to Ebmeier. "That's why we are set up for 80-column. When micros came along, the narrow screen display was a problem." AGNET now has thousands of subscribers, farm operators (40 percent) and agribusinesses in 45 states and six Canadian provinces. Farmers can get information on cattle and livestock production, marketing information, financial planning, consumer programs, as well as weather and information on markets — both foreign and domestic.

While AGNET is far flung, the oldest computerized farm program was developed at Michigan State University in 1963 with a grant from the Kellogg Foundation. Dubbed TELFARM, the Michigan State University farm accounting system has been on mainframe since that time, although farmers must go to a district or county extension office to have programs worked out for them by an ag extension specialist. TELFARM, according to Jim Mulvany, who was one of the first extension computer specialists and who now manages the TELFARM program at MSU, was designed to run programs that farmers used infrequently. "Least cost dairy and swine rations (programs to determine the most cost effective way to raise and feed livestock) maybe would be used once a month," says Mulvany. "And financial management plans, maybe once a year. It is not high user software." For that reason MSU has not broadened the scope to push into the home computer market. The program is written in FORTRAN and is admittedly not user-friendly. However, MSU has expanded the kinds of information it provides to agribusiness and to farmers (via extensions services) with other agricultural computer programs including TELPLAN, which is really a conglomeration of 70 different programs on beef farm planning, dairy farm planning, family living, general agriculture, swine farm planning and special purpose programs, all developed with a Kellogg Foundation grant in the late 1960s. PMEX, a pest control and forecasting mechanism and CCFS, a crop monitoring system that tracks diseases as well as insects are two others that have been added. MSU stays with the centralized approach and is hooked up via personal computer to very few individual farmers.

Farm Profitability

Most videotex suppliers will agree that farmers get on a system to receive information on weather, market prices and market information and analysis. But how does this information translate into more farm profits? And is there any way that better information can help control food prices for all of us?

Harold Scott, now with Tandy Corp. in Washington, D.C., was formerly with the National Weather Service. "The Weather Service," Scott points out, "provides more than one kind of weather forecast. There are ones for the public, aviation, agriculture, marine and research. The GAO had prepared a report saying that the weather forecasts being prepared were good, but that agriculture wasn't getting them." When the report came out, Scott says the TRS-80 Model I was also being introduced. He considered the problems of agricultural weather needs and conceived the idea of what came to be Project Green Thumb, a weather and market information videotex service for farmers.

Project Green Thumb, sponsored jointly by the University of Kentucky, NOAA, Motorola, Western Union and Tandy started in 1979 and ran for approximately two years. One hundred farmers in Shelby and Todd counties in Kentucky could call up the Green Thumb service, using the specialized equipment and an in-home "shopping list" of specific information needs. Every kind of information had a number, which they requested. The information was then sent to the in-home computer. It was stored there for review at a later date. The storage and review off-line features reduced phone bills for farmers, one of today's common complaints by farm videotex subscribers. Although Green Thumb was considered a success, and the information had an impact on other programs such as the American Farm Bureau pilot program, Green Thumb is now on hold due to lack of funds. But Scott says some of the information and the way it was used demonstrates the importance of weather to farm production. He cites some examples:

- "Above 98°," Scott explains. "Chickens and turkeys have a hard time living. It takes about two days prior to high heat to prepare the houses

Roy Alleman

University of Nebraska microcomputer specialist Jim Emil instructs a class in programming and AGNET: Helping farmers into the Information Age

—where they are raised nowadays—to keep them cool during a prolonged hot spell. Otherwise they will die from heat stroke." Advance weather information gives farmers time to prepare their facilities to combat adverse weather conditions.

- "Irrigation—" Scott continues, "normally you want to wait until corn wilts before irrigating. Then water and flood. Say you irrigate. Then it rains over your water. With accurate information, you may irrigate, but you don't flood if it is going to rain."
- "Insects are controlled by the weather," Scott says. "They grow or die, depending on weather conditions. With a decrease in pesticide use, you have to get chemicals on the crop at the right time to affect insects. By watching the weather, you know when to spray. Some sprays have a usefulness of only a day or two."
- "Drying conditions," according to Scott, "are also important. Hay needs three days of dry weather after cutting, or it rots in the fields."
- "Certain seeds need a soil temperature of 50° or more to germinate."

Alan Brugler of the Ohio Farm Bureau and Bob Craig of the Michigan Farm Bureau concur. "A farmer doesn't want to put on $30/acre herbicide if it is going to rain in 24 hours because the rain will wash it away and ruin the effectiveness," Brugler says. "Some fertilizers," says Craig, "like anhydrous ammonia, you want it to rain within a week's time. On the other hand, there is a critical time period when blights or insect infestation problems occur and you do not want rain for up to 48 hours after it's applied."

Accurate weather information alone can help a farmer save thousands of dollars in expenses each year. But other information programs can help control costs and improve profits in livestock production. For example, AGENT had FEEDMIX, a program that balances feed for cattle to find the least cost formula for feeding to get them to market weight by a certain time. The data base includes 200 standard feeds, but has room for substitution of a farmer's own feed. WEAN and YEARLING are two programs from AGNET that are designed for ranchers interested in improving the genetic makeup of their herds. Calves are watched from birth to market and compared, head to head, so that the best producing dams and sires can be identified.

World food picture

While videotex information is used on the farm to increase profitability, few farmers or farm organizations are addressing the world food picture. Rather, they are concerned with survival in fluctuating economic times.

"Farmers are becoming more sophisticated," says Ebmeier of AGNET. "What happens overseas affects prices in the U.S. "Many watch the financial futures. When the dollar is stronger, it makes it harder to export. Our reports offer another marketing perspective."

Rob Boyson of the American Farm Bureau doubts that changes in commodity prices have much impact on consumer prices. "It is safe to say that labor and transportation and marketing and packaging make up a substantial portion of the cost. We aren't affecting that portion. Only a certain percentage (of all U.S. farmers) subscribe to our services. Prices of farm commodities have plummeted in the last year. Corn was down 30 percent. I'm sure the price of corn products did not drop by a third."

And international incidents continue to affect the farmer, as Don Smith points out. "With the grain embargo, we still sold wheat, but didn't get as much for it." Smith estimates the grain embargo, which affected all grains, not just wheat, cost him $10,000 to $12,000. But he also says that in the last year, using farm videotex services, he made an additional $10,000 to $15,000. "It's not all directly related to the computer," he adds. "It's my decision to do a better job of marketing. Forward contracting, hedging by trading commodities on the Chicago Board of Trade. I did more, but kept track with the computer."

Today's farmers, squeezed by high costs and struggling to survive in a hungry world, continue to rely on those things which have put them in good stead for centuries: hard work, planning and luck. But more and more of them are relying on another source—the computer—to help them plan their work, check their plans and, they hope, improve their luck.

Kathy Bissell is a free-lance writer from Columbus.

DOWN ON THE FARM WITH AGNET

By Roy Alleman

A customer walked into Bob and Tom Weber's feedlot office near Dorchester, Neb. to inquire about feeding a pen of steers. They plugged their computer terminal into AGNET and in a matter of minutes had a complete projection of performance for the size and quality of cattle the customer planned to feed, feed and feedlot costs, and approximate marketing date. The customer decided to go ahead based on the readout, purchased a June delivery futures contract and locked in a profit.

"Without AGNET we could have spent an hour or more doing this," explained Bob Weber. "Not only is it quick, it is accurate and the customer respects it."

AGNET is what it implies — a network of agricultural universities tied together with a computer in the capitol building in Lincoln. Six states combine their knowledge and resources to furnish farmers and agri-businessmen with over 200 programs that can be used in decision-making. These programs range form least-cost livestock rations, irrigation scheduling, cash flow projections to calculating costs of canning food at home. Ask AGNET a question and it will help you find answers.

States involved, besides Nebraska, are Wyoming, North and South Dakotas, Montana and Washington.

"These six states have AGNET staffs," said Patrick Ebmeier, AGNET manager located at the University of Nebraska. "But we have users in 45 states. These have special telephone arrangements whereby the user can dial a number which connects him to the computer in Lincoln.

As many as half the programs are developed by staffs outside Nebraska, says Ebmeier, each develop programs to fit their particular needs but make them available to all.

Agri-businessmen use AGNET to help customers with seed and chemical decisions as well as feedlot rations.

Custom feeding is a small part of the Weber business which includes their 2,500-head feedlot and 1,500 acres of mostly irrigated cropland. However, they use AGNET just as effectively in their own decision-making, whether it is finding least-cost rations, determining when to sell cattle, or planning a cropping program to produce feed for the livestock.

They use AGNET most heavily for irrigation scheduling, ration adjustments and marketing. "We don't have

Roy Alleman

Nebraska farmers Tom and Bob Weber access AGNET: Videotex is changing the core of American Agriculture

to make a 'sell' decision based on one source of information now," says Bob.

Ebmeier says irrigation scheduling is the most used program, especially in season. "Irrigation specialists tell us a farmer can reduce, through proper scheduling, water use by one-third and not reduce yields. But that is not all, if he combines scheduling with proper soil testing, he will save on fertilizers in future years because it will not be leached below the root zone."

Tom Weber agrees. They use it consistently. "We have eight wells on 1,200 acres, each with a different water and management problem," says Tom. "Right off it saves us the $5 per acre we were paying a crop management service we were using before.

"First, the computer needs to know planting dates, when we last irrigated, length of growing season of the variety, well capacity and how long it takes us to get over the field. AGNET has several weather stations around the state which relay temperatures and rainfall to the computer between 2 and 3 o'clock in the morning.

"We supply moisture depletion rates determined by moisture blocks set at different depths in different parts of each field, or by means of moisture probes. From this data the computer determines daily crop water use and gives the starting date for the well involved."

It is hard to determine how much water is saved but Webers' normal 10-12 inches per acre is well below the state average.

"I can say it has prevented under- and over-irrigation," adds Tom Weber. "Irrigation is now much more timely and that is critical to top yields."

Another popular AGNET program is *Tractor Select*. Webers used this recently before buying a new tractor.

"We plugged in what we wanted a tractor to do and it gave us a list of tractors that would meet our needs," said Tom. "Based on information supplied we purchased a 140-hp International two-wheel drive tractor. Right now we are considering a new 8-row combine to replace our old 6-row."

The Webers use a Texas Instrument terminal which costs $1,500 with the telephone hookup. They don't think a microcomputer is needed as long as they depend on AGNET. The cost is minimal — like a recent four minute call which costs 90 cents. "And we consider AGNET especially 'user friendly,' " says Tom.

The two farmer-feeders got into computer farming and feeding after a long talk with their agriculture agent Jim Emil.

"He came out and helped us run a few crop budgets," explains Tom. "We could see that we could use AGNET's help. Emil, like most county agents, has a terminal hooked into AGNET, but he doesn't always have the time to do it for us. That is why we bought our own three years ago."

Annual membership costs $50.

"We find farmer will spend from 10-15 minutes per call," says Ebmeier. "Generally costs run about 50 cents per minute including phone time. "We update the futures market twice daily. Other market information containing either prices or analyses of market factors arrives daily, weekly, or monthly."

Roy Alleman is a free-lance writer from Hastings, Neb.

GRAIN FARM BREAK-EVEN ANALYSIS ON COMPUSERVE

Lornie Mattix's family has been farming in the U.S. since before the Revolutionary War. Today, Mattix, a brother and a neighboring farmer/businessman have created a farming software program for CompuServe users.

The initial program helps grain farmers determine all kinds of what if situations. "If we use heavier fetilizer," Mattix says as an example, "can we expect a couple more bushels per acre?" The program can determine the costs and anticipated profits of such a change. This, according to Mattix, is just one way grain farmers and agribusinesses can utilize the break even analysis now on line.

"Before we developed this program, it used to take us two weeks pushing pencils and with a calculator to figure out these things. Now we do it all in a morning." Mattix says. "It just simplifies things, does the math."

Mattix indicates the program is just for grain farming and, as such, is not a compromise program that tries to do too many things and no one thing well. However, he adds it does calculate the bottom line quickly, and according to his own experience, satisfies bankers.

Mattix and his three brothers have used a version of the program for five years on their 3,000 acre family farm business near Upper Sandusky, Ohio. The program on line has three years of working experience behind it, although Mattix confesses it has been through some 42 revisions.

The break even analysis, when coupled with worldwide information from the Commodity News Service on CompuServe, can help improve information for farmers and all who are involved in agribusiness operations. The Commodity News Service has futures market closing prices, agricultural news, economic news, and even global weather.

"It used to be," says Mattix "that farmers had 80 acres and could run the whole thing out of their back pocket. Now it's not unusual to borrow $400,000 in operating money for one year." Mattix attributes much of the problem in agriculture today to farmers using 19th century bookkeeping methods for 20th century farming. "It's no longer a small business," he adds.

CREATING SOFTWARE FOR THE FARM

by Dixon P. Otto

"I had no intention of doing anything with computers again," says Neale Bartter of Wooster, Ohio, reflecting on the time in 1974 when he gave up a computer career for farming.

"Now I spend most of my time in here with the computer," he says from the office of his turn-of-the-century home. He nodded towards the micro sitting on the desk next to him. Another sets on the dining room table in the next room, looking a bit incongruous amid the early American furniture. Others now run the farm while he concentrates on a new business: Creating computers systems and software for farmers.

Neale Bartter was raised on a family farm in Northern Ohio. He graduated from Ohio State University with a degree in agriculture economics in 1960, expecting to return to that farm. The economics of the real world dictated otherwise.

His introduction to computers came in 1962 while working toward a masters degree, again in agriculture economics, at the University of Delaware. "This was before they ever had any courses in computers," he says, "But while I was working on a masters degree, I started working with the boiler industry on linear programming." His thesis, done with the aid of a computer, was on linear programming for the boiler industry. A career in computers was born.

Most of what he learned about them came on the job. He worked for the Ford Motor Company, then for a chain of newspapers in Michigan, setting up one of the first computer systems for newspapers. Then he worked with early minicomputers for a Cincinnati firm. In 1974, he left industry, returning finally to the farm. He bought a farm in Wooster with his brother. He is now sole owner of it.

He had other plans, too. "I wanted to go into business myself. What I really wanted to do was start a software house," he says, "That wasn't really the time." In 1974, no one was interested in such a futurist idea. He thought computers were totally in his past. "I didn't keep up with what was going on with computers," he says, "I didn't read magazines on them or anything." He had no intention of doing anything with them again.

Then, in late 1979, a friend invited him over to inspect his Radio Shack Model I. "I was amazed at the progress since I had left computers, "Bartter says. A week later he had one of his own.
week later he had one of his own.

Normally, doing a costs analysis for the production of hogs took him several evenings of work with pencil and paper. "I hadn't programmed in BASIC in years, but I started in at 9 p.m.," he says, "By 2 a.m. I had done what it took all that time to do on paper."

Such a useful tool interested others, too. A nursery-stock broker through whom he sold trees became interested in having a system set up. "He wanted something to keep track of his customers," Bartter says. In July, 1981, Bartter set up a system for the broker and, a new business for him opened.

"I've come full circle," he says. He was in the software business at last— and more. He looks over an operation, and selects the clients' hardware that will suit their particular needs. Then he writes software tailored to their particular situation. For example, a nursery had a program for employees that automatically set aside a portion of wages into a savings account. The software Bartter set up was tailored to fit this unique situation. He has set up about 10 systems since that first one. Word of mouth has been his best advertisement. The time needed to set up a system—from when he first looks over the farm operation until the computer system is in operation—takes about six months.

Farm software programmer Neale Bartter: "In a decade, all farmers will own a computer."

"When I start with a system for someone, everything has to be spelled out to them," Bartter says. Half or more of his time is spent helping the customer master the operation of the systems, sometimes nearly "holding their hand" as they learn.

Bartter writes all the software used, except for word processing. He believes his software is superior to "canned" programs for several reasons. "With my programs, the user doesn't have to look anything up in a manual — no one reads them anyway. Nothing is code driven. Everything an operator needs to know comes up on the screen."

Most of the systems are self-contained on one disk. "The user doesn't have to swap disks back and forth," he says.

"I use a much more efficient filing system," he says. He writes his programs using all random access files as opposed to serial files used in canned programs. Such a system makes programming harder for him but makes use easier for the customer, he says.

"I can change the program easily when I have to, which I couldn't do with a program written by someone else," he says, "I also have trained most of my customers to change soft-

ware over the phone. For instance, I had a customer call about a program which wasn't working just the way he wanted. I told him over the phone to change a couple of the statements." Bartter is close to the day when he can send programs over the telephone, he says.

Bartter has set up a system for Range Quality Pork, of Sedalia, Ohio, one of the largest hog farms in Ohio. The operation is based on "total confinement," of the animals with 1,250 sows all kept in a 600-by-800 ft. barn. Bartter set up two computers for them. One in the office does the accounting work such as accounts payable and receivable, general ledger and cost analysis. Another in the barn tracks the day to day activities of the sows and schedules daily work flow. For example, 21 days after a sow is bred it must be checked to see if it is in heat. Each day the computer indicates which sows should be checked. The system in the barn uses a hard disk.

"I always thought floppy disks were the last word," he says, "But now it's hard disks. A floppy would never last in the dusty, dirty barn." The hard disk works without a problem, he says.

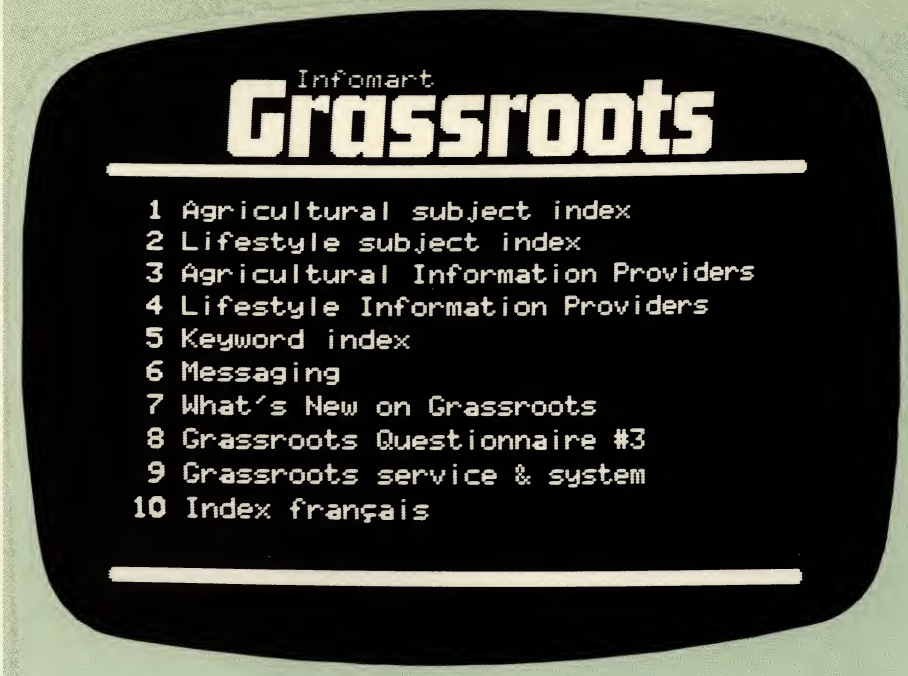
Bartter recently has signed a contract with Agri-Management Systems of Dayton to write software for the farm, mostly accounting programs so far. The company plans to hold courses with 15 hours of instruction on computer use for the farm, he says.

"The greatest need now is for education," he adds.

"In a decade, all farmers will have a computer," he predicts, "I think the farms that are going to survive will have to have a computer, not just because they will want to have one." Cost will not be a factor. "The systems cost less than $10,000, which is not much in comparison to other farm costs," he says. And he forsees banks, which have an interest in sustaining the farmer, providing computer services to them.

Bartter says there will be a real need for consultants to perform in many industries the services he is now doing in agriculture. In 1974, he may have been ahead of his time with the idea of starting a software house. In 1983, his consulting activities may have come just in time to aid the financially-ailing farmer.

Dixon Otto is a free-lance writer from Cleveland.



GRASSROOTS: CRACKING THE AG MARKET WITH GRAPHICS

While most agriculture and consumer videotex services in the U.S. are primarily word-based, a Canadian firm, Infomart, has developed a sophisticated graphic videotex service for farmers in Manitoba. Called Grassroots, it has worked so well for farmers in the one Canadian province that Infomart plans to expand Grassroots service to both Saskatchewan and Alberta by spring of 1983, to Ontario by summer, to the U.S. by the end of the year, and nationally in Canada by 1984.

Graphics are provided via monitors. The phone company sells or rents the equipment. Canadians call it Telidon. The total system is a receiver, a CRT and a modem. it is sold in Manitoba for $700. A recent article in *Farm Journal* assures readers that the Telidon graphics are "superior to that of its chief competitors."

Leigh Sigurdson of Infomart in Winnipeg says the database offers a "full range of agricultural information, two-way interaction, graphic weather pages, and other around-farm data such as soil moisture content. We also have the Chicago Board of Trade the Mercantile Exchange, the Mid American Exchange, the Winnipeg Exchange, all on a ten minute delay."

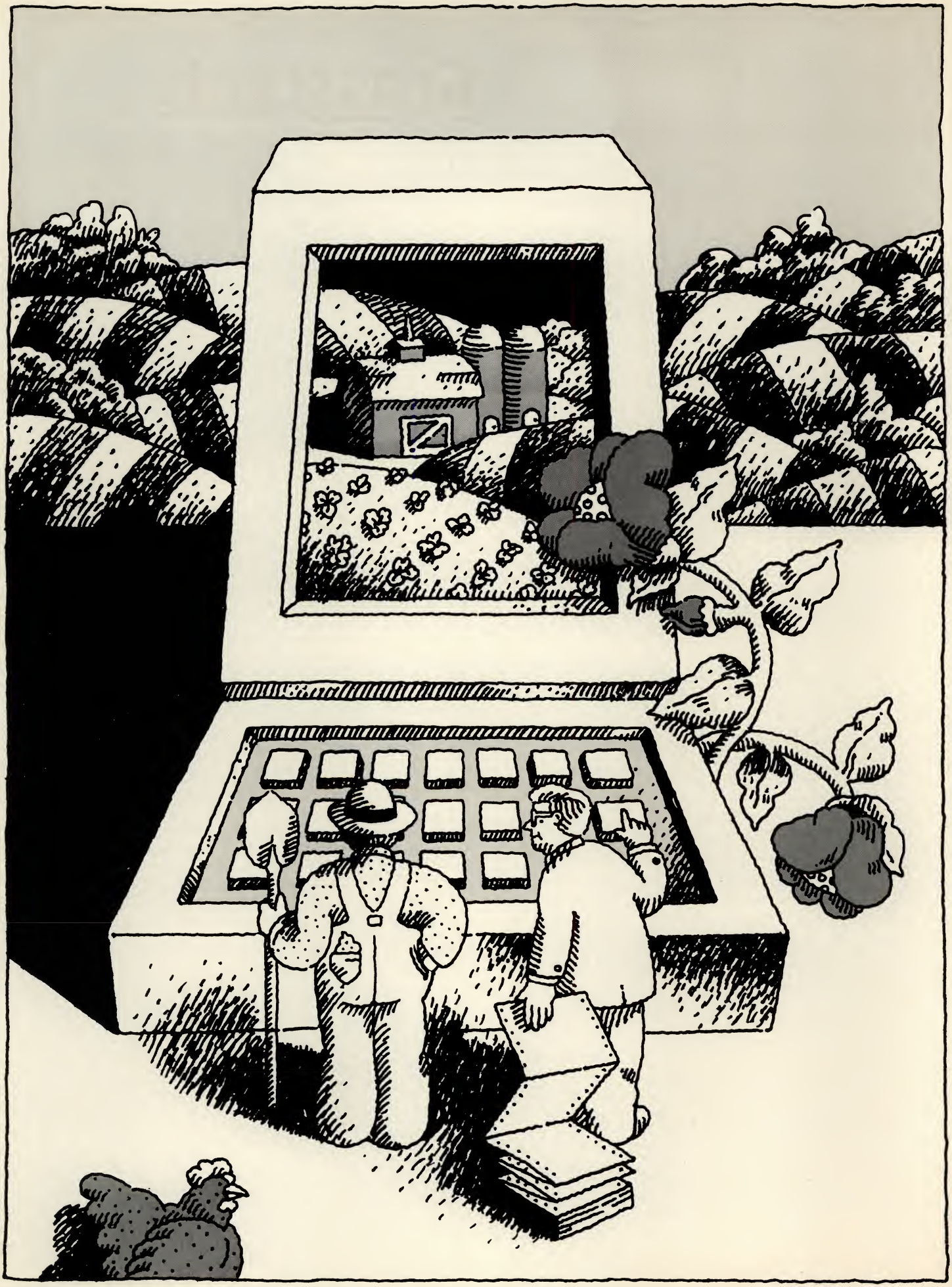
Grassroots has 16,000 pages of information. "We charge *suppliers* a per page, per month fee to be on the system," he says. To date they have 120 information providers.

Sigurdson mentions problems with phone lines in rural Manitoba similar to those noted by Merold Yates of the Illinois Farm Bureau (see main article). "Rural party lines create problems for the telephone company as well as for the user," he reports. "There has been some discussion of what policy should be for dealing with emergencies on party lines. Last I heard it was still under discussion." Manitoba farmers have had the problem of bad connections and interrupted signals similar to those reported by Illinois farmers.

Of the graphics, Graham Rose of Infomart says the screen resolution is about that of a standard TV set, 200 x 256 pixels. "Telidon," he says, "sends instructions to the computer on how to build an image on the screen. Instructions are coded and are sent to the computer (in the home or on the farm)."

But while the Canadian service is flashy and pretty, perhaps the most provacative note is that it's free. "The phone company charges 5¢ a minute to hook up," Sigurdson says. The other charges are borne by information providers. It works out to a miniscule $3.00 per hour.

—*K.B.*



Mary Lynn Blasutta

AN AMERICAN MEGAFARMER

by Dixon P. Otto

Hard work and farming—the two go together like clouds and sky. Bob Becker knew that. He was a farmer. Clouds and sky . . . some days it hit home harder than others — and this had been one of them for Robert Becker, age 31, graduate *cum laude* from Penn State, occupation farmer.

Thank the heavens the day was done, his shift over, he thought as he loosened his blue knit tie and pushed back his squeaky-wheel chair from his VDT at the Consolidated Farms Control Center.

He had keyed in that morning only to find the nutrient broth in the carrot hydroponics loaded with enough nitrogen to fertilize the continental United States. He had spent all morning hunting down the problem — a plus where a minus should have been in the new mixture program. He had just had time to call a printout of the latest crop-growth figures before the executive lunch. He had rushed to the Chinese restaurant only to find out they had already decided over soy-sauced food to cut soybean production. He had waved his printout in Jensen's face to no good purpose. He had huffed back from lunch only to find the automatic irrigation system gone crazy in field E-34, spouting water as if the arid sands of the Sahara Desert had suddenly been dumped on the moisture sensors . . .

Thank the blue skies it was over now — wasn't it? He checked the general status readout one last time, as if in shell-shocked doubt. The display flashed Christmas-tree green, not a red light on the screen. He could relax for another day, so he thought.

Becker updated the log for Henson, then signed off for June 28, 1995. He stood up and uncoiled his tall frame, then swept his suit coat from the back of the chair, thinking: better be out of here before Henson shows up for the swing shift. Henson, the crusading archenemy of defenseless soybeans, would be gloating over the cutback.

I need a drink, Becker thought. He looked over to the "cow cubicle" where Hank Eastwood was bent over the dairy console: "Hey, Hank, how about leaving your cows for a drink?"

"Ahhnnawww," Hank sounded like a cud-stuffed milker himself, "Gotta re-balance the feed mix for our growing young ones again."

"You're worse than a new mother."

"Ahhh, got this new feed program I wanta try out," Hank said, not turning from the screen whose numbers flashed as if in agreement.

"What did poor cows do before programmers told them what to eat?"

"Ahhherrr." Hank was already back into his work.

Maybe a solo drink would not be so bad, Becker thought — he could hold a private wake for all the little soybeans that now would go unborn — R.I.P. — wash down the day in peace. The Shot Glass Bar was across the street, although the best June sun could not brighten its dingy cement-block exterior. It would do — the unborn soybeans would never know the difference . . .

Good, no one here to bother me, Becker thought as he banged his way past the old wooden screen door. Only one other customer sat hunched at the far end of the bar. Becker could see a patch of gray hair smiling out of the back of the guy's baseball cap. The head bobbed once, twice, but did not turn around. The man must be anesthetized beyond the point of playing "stare at the person coming into the bar." Good. Becker went to the other end of the bar where the bartender stood, hands in the suds of a sink beneath the counter. He ordered a gin and tonic from the silent, blank-face man. The bartender creased his brow as if mad about being interrupted from playing with a glass in the suds like a toy boat.

"Rough day on the farm?" the bartender asked in an uninterested monotone as he delivered the goods, feebly following the bartender's oath to attempt pleasant conversation.

"Yeah," Becker responded with like enthusiasm, inspecting the beer streaks on the dark surface of the counter. He wondered how much beer it took to make the counter sticky enough to capture a fly . . .

"Farmer?" the old man in the corner came alive as if zapped with all the electricity the Niagara could deliver. "You a farmer?" he asked, sharp eyes as bright as first-magnitude stars even in the dim light of the bar.

"Yeah," Becker said. He went back to searching the bar top for grounded flies. Oh no, he thought — the old man was sliding over from barstool to barstool like a leaping frog. Becker did not look at him or in any way acknowledge his existence, but followed his progress in the mirror behind the rows of soldier-stiff bottles. The old man settled into the stool next to him and peered over. "Oh, one of those Consolidated Farms fluorescent-tube farmers. I thought for a minute maybe a real farmer — but look at you."

Becker looked at himself.

The old man continued, "A farmer in a business suit — ha . . . errr . . . ha." The old man issued a loud belch that was more distinct than his mumblings. Becker still had not looked directly at him. "Don't think I know about farming — ha," now the old man was talking more to himself than to Becker. Louder: "In my day a farmer was close to the

soil — and looked it . . . "

Becker did not respond, but watched the ice melting in his drink as if trying to disappear from the scene. Maybe I should just stand up and leave, Becker thought, but that might stir the old man to unparalleled heights of vocal activity. A glance to the mirror revealed one bird-like eye trained at him from circles of wrinkles — like a camera in a bank.

A little louder, the old man continued, "I bet you couldn't tell a cornstalk from a sprout of Sudan grass without the aid of a computer."

That was enough. First, spoiled soup in the hydroponics, then spoiled lunch over soybeans, and then monsoon-irrigated fields. Becker had taken enough. "What do *you* know about farming?" he asked.

"I used to own a farm — and I didn't need a computer to tell me that when night falls, you turn on the lights."

"What happened to your used-to-be farm?"

"You work for Consolidated — you ought to know," the old man said, his wrinkles deepening at the word "Consolidated."

"What do you mean?" Becker met the old man's gaze beady eye for beady eye.

"You know the place you people own down Jackson Road past the big dip in the road?"

"On the left as you head out of town?"

"On the left."

"Sure — that's Field W-191."

"Before it had a number it had a name — I called it home. There used to be a house right there on the curve in the road — my house. I had to sell it — over a dozen years ago. Sold out to your Mr. Zimmer. You know Mr. Zimmer?"

"Sure — he's the principal owner of Consolidated."

"Oh — he still shows up now and then?"

"He's still quite active. He must have bought you out back before he formed Consolidated."

"Yep — I was one of his first victims," the old man said with mock pride. He sat up tall on the stool, his Silly-Putty nose aimed at Becker.

"You must have sold the place for a reason."

"Ha — some choice I had. Land prices — up. And I didn't need a computer to follow the rise in taxes. Equipment prices — up. Fuel prices — up. And crop prices? As stagnant as a Florida swamp. What could your computer do about that?"

"At the very end, nothing. But perhaps before you were swamped by costs, it might have made the difference."

"You tell me how, business-suit farmer."

The battered brim of the old man's baseball cap jutted at Becker. He ignored it and the personal digs. "Better planning," he said, jabbing a finger down on the slippery bar top, "better organization, better management, a better grasp of the business side of the farming business. With a computer to organize all the data needed to make the big decisions, you might have been able to foresee coming problems while you had time and capital to do something about them."

"Data — ha. Farms were failing all around, Mr. Numbers. And it wasn't all bad business sense suddenly killing them. It was increased costs, increased mechanization — all that hightech stuff you plug yourself into day after day. Suddenly a tractor wasn't a tractor, but had to come with an enclosed air-conditioned cab with AM/FM stereo. And it was the specialization — how could you compete with those womb-to-womb animal factories? I had to give up the cows. Then I had to give up the hogs. I had to depend on one of two crops to make it. And when for some reason, any of a dozen reasons, they didn't make it? Well, what could your computer say?"

"Your computer long before would have helped you see just where your best profit was. Contact with others in your situation through computer networks may have helped you find alternatives and new methods to help assure a good crop."

"Computers and high tech to my salvation? To my way of thinking all that stuff helped bring me down. Your computers may have told me, if I could afford the programs and all the other stuff that goes with such a system, what new seed could improve yield, what new fertilizer could improve yield, what crop to switch to. But then come your high tech and chemical companies with their new just jim-dandy device — at a price. And their new, genetically-improved seed — at a price, of course. And here's some great super-growth hormone — at a price, of course. Shall I go on?"

"No. But that's just it. A micro doesn't cost that much, especially for its return. With increased costs, each expenditure is all the more important. A computer would have helped you find out just which were most important and what you could do without."

"What good is it when you reach the point where you can't afford what the stupid computer tells you that you need? Tell me that? Do you think I could afford those fancy hydroponics you have? That needs constant computer control — and not a little hand-held one, either. The same with your soil monitoring system and irrigation system and computer/robot-assisted harvesting system. How can the little guy compete?"

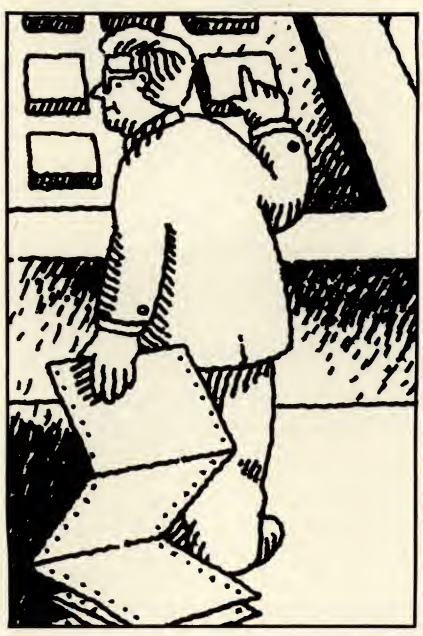
"Maybe the little guy can't anymore. Farming is being radically changed by high tech as never before. That means increased initial capital outlay. Perhaps farming is not so different from other industries as we once thought. All industries start out small; almost any person, with the right smarts, can enter them. Even the microcomputer industry had its garage-industry infancy. Then companies grow; the competition increases. The industry grows, with increased sophistication. The newcomer is shut out; competition then shakes out the smaller, less innovative

operations."

"Stop right there."

"Why?"

"Farming is just another industry — huh! First, those big corporate farms weren't the best innovators. Big companies get conservative — everything done by committee. They don't take risks on something new. The big faceless operations don't pick up on anything unless it's tried and true, and they have a computer printout to show it. The family farmer would take a look at things and use his smarts to figure out if it would work. Family farms, ones big enough to afford technology but not so big as to hire nonfamily workers, were the innovators. That's a fact. But they are the ones that's been squeezed out. All that's left is the corporate operators with their corporate-made chemicals and their corporate-bred plant and animals. They bring in their fancy, expensive genetically-engineered crops and pump up the yields to show their short-term profit. Well, I know about those crops. I know they are more vulnerable to disease, less resistant to insects and require big capital investments. Someone could be in for a big fall. But I'm afraid it will hurt everyone. Ha — it won't just be me or farmers like me."



"Technology can be used sanely or insanely. The answer lies in better use of technology. We use satellite monitoring of crop and disease patterns coupled with computer analysis. Our networks keep us alerted to the smallest changes."

"It all costs money."

"Not all — look at how the prices of computers has plummetted. It could happen in other areas."

"Could — ha. Let me let you in on reality. The big places don't care. Your corporate kind don't care. They all are just interested in the short-term profits, their next quarterly report. They deplete the soil for those profits, ruin the land and then move on — who cares, right? You belt a few drinks down here and then rip down the road in your car — away from it all — who cares, right?"

Becker felt a headache coming on — one bigger than his soybean-induced headache at lunch. The old guy did not seem so anesthetized now — could he have been laying for him like a fox? Becker crunched the last ice of his drink down as if he was chewing gum. He had lost the soybean wars; he was not going to lose this confrontation, too.

"That may be true — of corporate farms," Becker said, driving his words steady like a tractor over rough ground. "But as I said, things shake down. Maybe the corporate farms you are talking of won't survive the shake down. Maybe the people who know and love farming will be the ones on top — give them credit. I'll even name an example for you — our Mr. Zimmer, whom you seem to dislike. He started out as your neighbor, farming the land his father had farmed. But when times changed, he changed. He was a smart one — he used the new tools of computers and technology to save his family farm while yours was failing. The computer gave him the information needed to decide what crops were profitable to plant — so he didn't have to plant with just a hope that prices would rise to cover costs. Computers provided cash-flow analysis and cost accounting so he didn't have to sell his crops when the prices were low. Computer networks for farmers gave him the information he needed to survive and grow — pricing information, weather information, knowledge of new techniques and methods, put him in touch with other farmers in his situation. All of this he was doing at the same time your farm was failing. His business expanded. He isn't all there is to Consolidated Farms, but he is here, his family is — and I consider it a family farm." Becker raised his glass to his lips in victory — even though it was empty.

"But look at you," the old man had lost none of his fire, "You and all his employees, and all the others. You can't start a farm. The lifestyle of the independent farmer is closed to you. What will happen to the way of life that was farming? Look at this town. It has not prospered with your Mr. Zimmer. It was much more alive, with better physical facilities for the community and more citizen involvement in the community, in the old days."

"I wasn't here then."

"That's just it — farm families had roots, traditions, stability — they gave that to this entire nation. They cared about the community they lived in and the people they lived with. Now we have rootless workers and technicians — people who weren't born here, don't love this place, this land. They come and go, and the town decays."

"You may have a point. I can't answer you. The introduction of new technology does bring social change. Perhaps now is the time to decide the social framework in which the new technology will operate."

"You've got it backwards, young man. The situation creates the social climate; the social climate is not something created outside that framework. And the social traditions of the farm that served this country since its birth are being lost."

"But aren't our values something we create and carry inside us? Do they have to depend on anything but ourselves? I hope not . . . "

Becker stood up and swiftly left before the old man replied. He looked back through the battered screen door. The old man was hunched motionless on his stool.

Enough for one day, Becker thought. He did not have all the answers. He looked toward an engorged ripe-yellow sun floating on the horizon. A touch of summer warmth reached his face and began to burn away his headache. A little gardening before darkness, he thought. Yes, some quiet weeding in the garden will be relaxing . . . Bob Becker went home.

Dixon Otto is a free-lance writer from Cleveland

TAKING CARE OF YOUR COMPUTER

Illustrated Alaskan Moose

by Ernest E. Mau

When was the last time you cleaned your computer? I don't mean a fast wipe with a cloth or a quick pass with a vacuum cleaner, but a complete job on inlets, fan filters, card connectors, and under the keytops. Be honest. If it's more than a month, you've committed a cardinal sin of computer usage.

What many recreational and professional computer users overlook or ignore is that certain conditions contribute to unnecessary failures and malfunctions. Those conditions, hazardous to a computer system of any size or type, can be minimized to extend the operating life, improve overall performance, and reduce repair costs. Specifically, the areas of concern are dirt and contamination, excess heat, stray magnetic fields, electrostatic charges, power disturbances, and mechanical wear.

DIRT & CONTAMINATION

Modern microcomputers are exposed to dust, smoke, soot, chemical pollutants, fine particulates known as "aerosols," corrosive gases, and others with little or no thought about the effects. There are no totally clean offices or homes. The average office is full of cigarette smoke, urban pollution, and dust. The average home has airborne cooking grease, pet hairs, and carpet fibers, among other things.

Add particles of human hair, dandruff, upholstery fibers, bits of food, and the like, and you begin to have some concept of what the computer must endure. Still more problems include particles of printer paper, oxide from tapes or disks, fibers broken loose from printer ribbons, and so on.

Computer equipment cannot be airtight. Components generate heat and require a continous flow of cooling air provided by either natural convection or fans. Because more air flows through fan-cooled machines, they collect more internal dirt than convection-cooled ones and generally require more cleaning and care.

Effects

Dirt can cause anything from a gradual decline in performance to outright failure, and problems often build slowly until a malfunction occurs.

Outer-surface problems usually aren't serious. Dirty screens are hard to read. Dirty keys feel strange. Dirty covers are unsightly. But external surfaces are cleaned easily and cause few operational difficulties.

Serious problems are internal. Contaminated drives and diskettes aren't readily spotted, but show up as data misreads ("I/O errors"), head "crashes," damaged disk surfaces, or random intermittent errors.

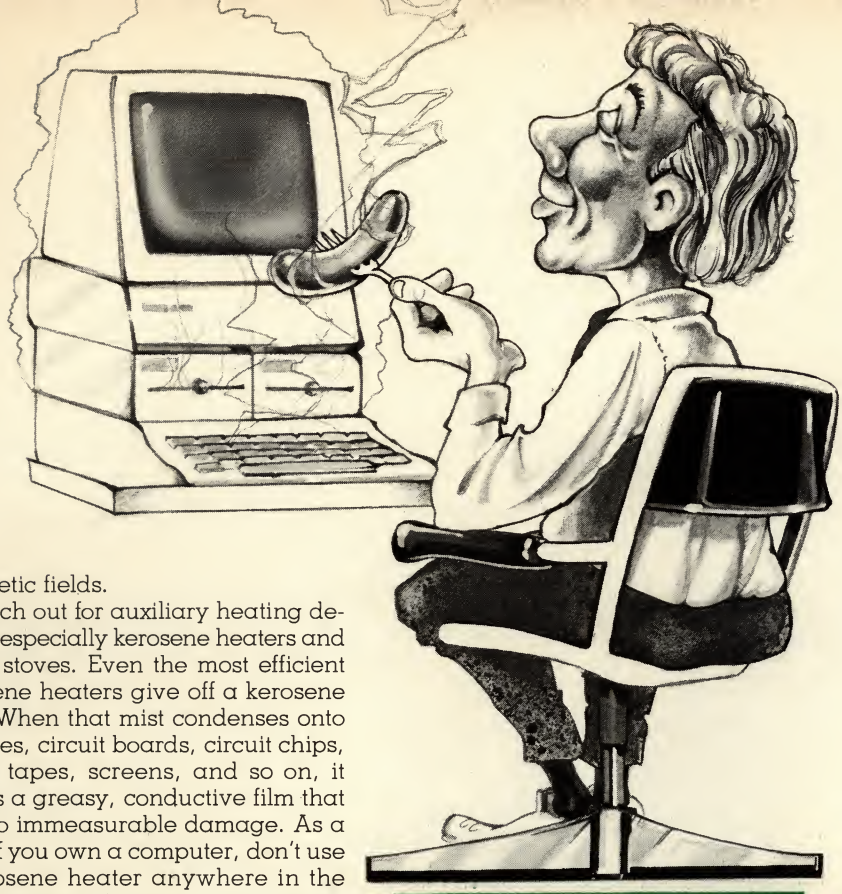
Dirt blocking the cooling air allows heat to build up, leading to damaged components and costly repairs. Contaminated connectors (cable and circuit board) and switches can fail to make good contact or can make and break contact intermittently. Even the telephone plugs of modems and other communications devices can be contaminated, leading to data transmission errors and the loss of expensive network time.

Furthermore, some contaminants are conductors, creating unwanted electrical paths and short circuits. Soot, graphite particles from pencils, metallic chips, and magnetic oxides are particular problems.

Preventive and remedial steps

The best cure for dirt-related problems is prevention, primarily through regular inspections and cleaning.

On the installation level, replace filters on forced-air heating and cooling systems every two to three weeks. In dry climates, install a room or furnace humidifier to reduce both airborne contaminants and static-electric problems. Portable room-air filtration devices also help, but the filters must be changed frequently. Futhermore, such units must be kept several feet from the computer and magnetic media to avoid potential problems from electro-



magnetic fields.

Watch out for auxiliary heating devices, especially kerosene heaters and wood stoves. Even the most efficient kerosene heaters give off a kerosene mist. When that mist condenses onto surfaces, circuit boards, circuit chips, disks, tapes, screens, and so on, it leaves a greasy, conductive film that can do immeasurable damage. As a rule, if you own a computer, don't use a kerosene heater anywhere in the same building. Similarly, wood stoves are "dirty" devices that lead to the unavoidable spread of ash, smoke, and dust. Though not as damaging as a kerosene film, those contaminants must be removed from both the outside and inside of the computer, perhaps as often as three or four times a week.

Clean your installation, system components, and surrounding area every week. Vacuum the floors, baseboards, window sills, and furniture. Wipe down desk or table tops, component casings, and other exposed surfaces with a soft damp cloth or a commercial cleaning product intended for computer use. Be certain the cleaning cloth is damp, not wet. Avoid detergents — they leave residues that cause more contamination later. Avoid chemical solvents, particularly degreasing chemicals — they can damage components.

Make use of the many cleaning products available for computer and electronic equipment. Things like screen-cleaning solutions, pressurized clean-air canisters, and lint-free cloths are essential for proper care of your equipment. Make a special point of obtaining and using a disk-drive cleaning kit, preferably one that contains a special disk and solutions so drive heads can be cleaned just by inserting the disk and activating a drive for 30 seconds or so. It's a warranty and service-contract voiding operation to open drives and clean them with swabs, so the special cleaning diskettes are about the only things you can use safely.

HEAT BUILDUP

Inspect all air vents and intakes, with special attention to filters and fan housings where screens or filters may block the air flow. Replace or clean filters and screens in accordance with the manufacturer's recommendations.

Check the cables to printers, terminals, disk drives and modems. A common cause of system failures or communication problems is a loose connector, and many connectors work loose just from the normal operating vibration of fans, disk drives, and printers.

At least once a month, inspect the insides of your equipment chassis, assuming of course you can open them without endangering a warranty or service contract. Be sure power is off and the power cord disconnected before opening anything, then remove the covers and look for accumulations of dirt and dust. Remove any such accumulations, especially around boards and connectors. Tweezers and a canister of pressurized clean air are useful tools for removing dirt. Do not reverse the hose of a vacuum cleaner and use it to blow into a device — if you've ever tried reversing a hose, you've probably seen puffs of dirt and dust emitted, and the last thing you want is to introduce that dust into your equipment.

Check mechanical components for evidence of wear. Look for worn spots on moving surfaces inside printers, especially on the rails and bearing surfaces of the printhead and print hammer. Be sure to clean paper chips and accumulated paper fibers from inside the printer. If the disk drives can be opened, check the rails on which the heads ride, and look for "burn marks" and abrasions on the magnetic heads. Also look for excessive deposits of oxide worn from diskettes, indicating a possible problem with either the heads or the diskettes themselves. Check all guide rails in printers and disk drives for dust and dirt that may interfere with smooth tracking. Follow the instructions in your manuals concerning lubrication of mechanical parts. If your manuals don't cover care and maintenance, contact the manufacturer and request or purchase a service manual.

Once or twice a year, be prepared to strip, clean, and reassemble your equipment—or pay a technician to do it for you. Remove circuit boards and clean the edge connectors and sockets. Check the seating of all integrated circuits. Check the seating of all cable connectors. Remove the keytops from the keyboard and clean out accumulated dirt. Basically, figure on a minor overhaul.

HEAT BUILDUP

Heat buildup is a sneaky hazard that can catch unwary users by surprise. All equipment has manufacturer-specified operating and nonoperating temperature ranges that must be observed. In general, personal and small-business computers and peripherals can operate successfully under ambient temperatures from 50 degrees F to 80 degrees F (10 degrees C to 26.6 degrees C); I don't know of any that can't operate in that range, which covers the limits of normal operator comfort, typically 65 degrees F to 78 degrees F (18 degrees C to 25.5 degrees C). It's critically important for the operating environment to be maintained within the specified range. If the temperature is too low, mechanical actions like disk accesses and printing can be come sluggish. If too warm, overheating may cause improper operation and anything from

intermittent errors to a total shutdown.

Remember that electronic and mechanical devices generate heat, which, if not vented or cooled can cause internal temperatures to reach far above the ambient temperature. It's that internal temperature that causes difficulties, and it must be controlled so the equipment can function normally. Often, it's necessary to install special cooling on the equipment. Things like slotted covers and auxiliary fans may be necessary to maintain satisfactory operating temperatures.

Particular heat problems occur when plug-ins are added to computers, with each adding its own heat to the total and possibly exceeding the cooling level for which the unit was designed. With smaller machines, the situation is compounded by vertical component stacking, where disk drives are placed on top of the computer, a monitor is on top of the drives, and so on. That creates a vertical heat column in which upper units block the cooling of lower ones while lower units add to the heat built up in higher ones.

The usual cause of excess heat is blockage of air intakes. Such blockages result from installing a unit with insufficient air space around, something placed over the vents, or dirt deposits on filters or screens. Internal dirt also serves to block the flow of air critical components.

Never install computer equipment above or near heat sources. Stay at least three feet away from heating vents or radiators. Keep at least six feet or more away from auxiliary space heaters including electrically powered radiant heat panels and stoves. Because of the double threat from heat and contamination, don't even get in the same room with a kerosene heater or wood stove — preferably not even in the same building.

Less obvious is the danger from direct sunlight. Sunlight striking the machines generates heat beyond levels with which the cooling air flow can cope. Heat radiated by window glass, drapes, carpets, and furniture exposed to the sunlight adds more problems. Furthermore, sunlight not only affects the system hardware, but it can warp diskettes and magnetic tapes, leading to the loss of valuable data.

MAGNETIC FIELDS

Effects

Often, the first sign of a heat problem is erratic operation such as numerous "errors" during data processing. Extended exposure to excessive heat shortens the life of circuit chips and other components, eventually leading to rising numbers of failures under various operating conditions. The cumulative effects can be both devastating and expensive.

According to one report, "Studies have shown that the life of electronics equipment is cut in half for every 10 Celsius degree rise in temperature. So if you keep your ... computer 10 degrees cooler, you double its life and also increase its reliability during normal operation." [1]

Preventive and remedial steps

No system should ever be damaged by heat — there's no justification for allowing such damage since heat problems can be prevented. If you keep the equipment away from sources of direct heat and out of direct sunlight, you have most of the problem licked with little effort. If you like to look out the window while you work, consider putting a commercial reflective window film on the glass in the computer area; bronze- or silver-tone reflective film is inexpensive compared to computer failures, it's easily installed, and it provides a substantial reduction in the heat generated by direct sunlight. However, don't rely on reflective films totally — some heat does get through, so draw the drapes as often as you can.

Keep the equipment clean, both inside and outside. Take care not to obstruct air intakes, vents, fan inlets, and other openings, either by placing something in the way or allowing dirt and dust to accumulate.

Third, allow sufficient space for free air flow. Never jam a unit up against a wall or set it on a soft surface like carpeting. Even foam vibration pads are dangerous to components having air intakes on the bottom (the "feet" sink in and the clearance to the bottom is reduced).

Don't stack components vertically, spread them out horizontally instead. That at least avoids concentrating the rising heat and creating an additive thermal column that easily overheats the uppermost units. Commercial workstations often used to house systems in a minimum area, finding that many of them concentrate the heat sources while they block the free flow of cooling air.

Install additional cooling whenever possible. Be especially alert to auxiliary fans marketed for units normally cooled by convection. Often, potential heat problems aren't evident until the system has been on the market a while and manufacturers begin providing plug-ins. Then, someone suddenly sees a heat related failure and realizes that convection cooling isn't adequate for a fully-equipped unit or that the cooling fans have been undersized. It's a safe assumption that the appearance of auxiliary fans on the market for a specific brand of equipment is an indication that extra cooling is required.

ELECTROMAGNETIC FIELDS

Magnetic or electromagnetic fields are hazardous because they can disrupt computer operations, alter data being processed, and erase magnetic storage media.

Every electrical current and, thus, every electrical or electronic device generates an electromagnetic field—

1. "Frequently Asked Questions about VENTOP," unpublished report (1982), Tovatech, 1903 Fordham Way, Mountain View, CA 94040.

some weak, others strong. Motors, bells, buzzers, transformers, and others all contain electromagnets, and some also have permanent magnets. All have electromagnetic fields. Even computer components generate fields, including ribbon-lifters of printers, disk-drive motors, and transformers in monitors and terminals. Furthermore, loose ferrous (iron-based) metal objects may be magnetized, including screwdrivers, pliers, wrenches, tweezers, scissors, paper clips, staples, and so on.

Effects

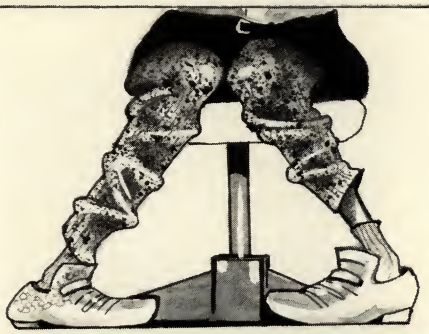
Like other hazards, the effects of stray magnetic fields are unpredictable, showing up as drive failures, memory losses or alterations, garbled data, garbaged printouts, pulsating displays, unexpected breaks or transmission errors in network communications, and so on. The most damaging is erasure of magnetically stored data. Interference with electronic operation is transient and generally causes little or no permanent damage to hardware, but lost data can be expensive.

Preventive and remedial steps

Most problems with electromagnetic fields are avoidable. Remove the source of the field, and the problem is gone. The difficulty is in knowing which item causes the problem in the first place, and people tend to overlook the obvious.

One offender is the telephone. Its bell operates with a powerful electromagnet, so putting the phone next to a box of disks could damage the entire contents of the box the next time it rings. Similarly, placing it near disk drives or memory circuits may interfere with storage and processing operations.

Audio speakers are a source of trouble for people who like music while they work. Speakers have powerful magnets to move the cones. In turn, the magnetic fields damage diskettes,



STATIC ELECTRICITY

tapes, memory contents, and read/write operations if not located a sufficient distance away.

Just moving offending devices three to six feet from the computer usually is sufficient. But be careful not to put them where you could walk through a field with a diskette or tape in your hands. In general, keep anything not required for computer operation away from the machinery, including tools, flashlights, intercoms, and other device of metallic nature or operating from an electrical outlet.

Be careful of video terminals and monitors, reserve power supplies, and similar devices. They often contain powerful transformers with fields that can devastate memory storage and mass media in no time at all. Some tape and disk devices are particularly sensitive and cannot be run within two or three feet of a CRT or monitor. That's another reason for not stacking a monitor on top of disk drives — the transformer can prevent proper read/write operation and can even erase disks while they spin in the drives.

If a device cannot be relocated, try shielding it from the other components with a thin sheet of soft iron or carbon steel. Often such an insert is sufficient to block the magnetic fields and protect the sensitive components.

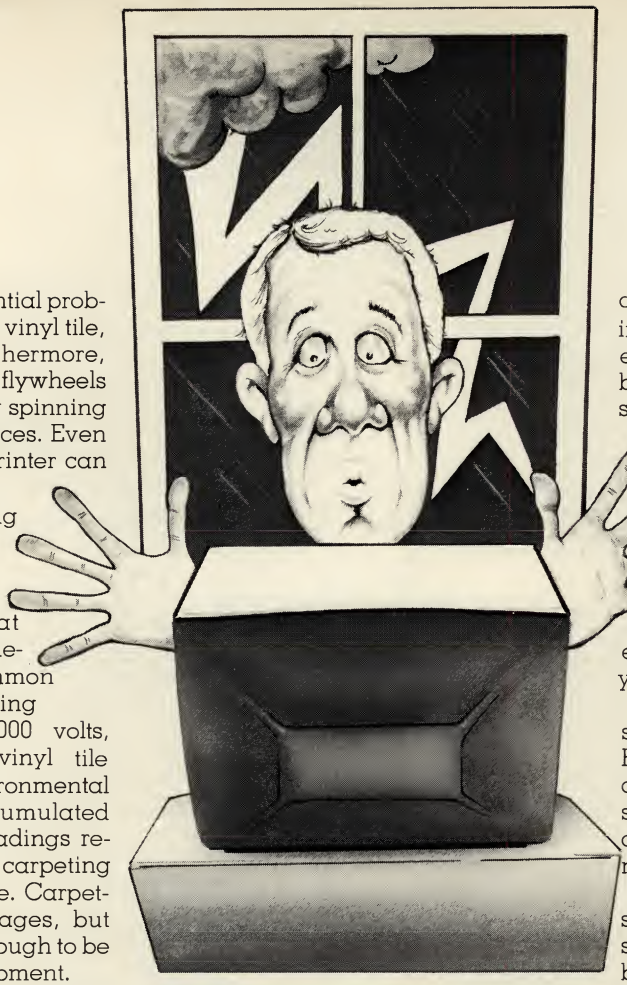
At all costs, protect your magnetic media. Store all tapes and disks in dust-protective jackets and boxes at least three to four feet from any electrical or electronic device. Never leave magnetic media on top of or alongside of the computer, drives, monitor or CRT, or printer. Never allow them near the telephone, speakers, calculators, or similar gadgets.

ELECTROSTATIC CHARGES

Static electricity is a constant problem around computers. Whether the problem is mild or severe, it's always present and always a potential source of malfunction. A good description of the phenomenon is provided by The Static Control Systems division of the 3M Company:

"In scientific terms, it is an imbalance of electrons on the surface of a material. Whenever two materials that are in contact are separated, an imbalance of electrons occurs on each surface, resulting in a positive charge (deficiency of electrons) on one surface and a negative charge (over-abundance of electrons) on the other surface. Because this charged state is 'unnatural,' each surface makes an effort to discharge, or return to its neutral state. A typical example... is a person walking across a floor (generating a static charge) and then getting a shock (discharging) as a door knob is touched. Quantitatively, when a person feels this shock, a charge of at least 2,500 volts is involved, a charge level high enough to cause malfunctions of electronic equipment...charges well below 2,500 volts can cause equipment malfunctions, so static protection may be needed even though 'shocking' is not present."[2]

2. Robert J. Kunz, "The Solution to Static Caused Problems with Commercial Electronic Equipment: 3M Static Control Floor Mats," Report J-SFMP(501)R1, Static Control Systems/3M.



POWER DISTURBANCES

All floor surfaces are potential problems, not only carpeting but vinyl tile, wood, and concrete. Furthermore, moving objects such as the flywheels and diskettes in continously spinning disk drives are internal sources. Even paper moving through a printer can build and carry a charge.

Just eliminating carpeting doesn't cure the problem. The 3M Company report just quoted goes on to cite experimental work done at Western Electric Co., Inc., determining that the most common buildup for a person walking across a carpet was 12,000 volts, while walking across a vinyl tile floor under the same environmental conditions commonly accumulated 4,000 volts. The highest readings reported were 39,000 volts for carpeting and 13,000 volts for vinyl tile. Carpeting generates higher voltages, but solid floors still generate enough to be dangerous to delicate equipment.

Contrary to popular belief, high humidity does not eliminate static. High humidity reduces charges and the danger, but it does not get rid of it.

Effects

The most obvious static effect is a spark from one object to another. But even when arcing isn't evident, static can do a great deal of damage inside electronic devices or to data stored on magnetic media.

Static can alter or wipe out the contents of memory, generate faulty data, blank a video display, cause unwanted printer carriage returns, and create a host of similar problems. Worse, static discharges can burn out circuit chips or entire circuit boards. A discharge to magnetic media can permanently destroy data or even damage the magnetic surface.

Interface cables are particularly vulnerable. Cables sometimes have to be routed where it's possible to step on them. While just walking across the floor, static then can be discharged into the cables, thereby "clobbering" the devices at either end. Again, this can lead to lost data, blown circuit chips on interface boards, fuse failures and system shutdowns, or damaged circuit boards. In network communications, the cords that connect the computer and the modem are entry points for static that disrupts the communications, garbles the transmissions, and generally incurs increased time and charges for the network use. At worst, static penetrating a telephone cord could damage the modem itself or the computer to which it's connected.

Expect static to cause erratic computer behavior at all levels from disk operations through network communications. Be alert to the possibility even if you don't see any sparking; if you get a spark when touching the equipment, you've got a real problem on your hands and will have to eliminate it.

Preventive and remedial steps

As usual, the best cure for static is prevention. Making sure every component is grounded serves as a good first step, but isn't a foolproof cure. Be certain the third prong (the round one) of every line plug is properly grounded. Don't attempt to defeat the grounding by cutting or bending the prong and don't attempt to use two-prong adapters without connecting their pigtail wires. If you have any doubts about the electrical grounds in your building, it pays to have an electrician check or install them before you hook up your computer system.

Other steps that reduce but don't entirely eliminate static problems include removing carpets and rugs from the working area, installing a humidifier, avoiding crepe or rubber-soled shoes, and avoiding excessive movement like shuffling your feet while working.

Connecting cables should be routed so can't be stepped on or touched. However, just putting them under a carpet may help avoid tripping, but static discharges can penetrate the carpet to reach the cable and connected electronics.

Sometimes, commercial anti-static sprays are helpful in cutting down short-term problems, but they must not be sprayed directly onto the keyboard, screen, or magnetic media. The residue left behind could cause later problems. Some sprays also are eye irritants, so be careful where and how you use them. Remember, you'll have to repeat the treatment periodically, and vacuuming the carpet or wiping the desk surface removes or degrades the anti-static protection.

Effective, long-term solutions to static problems are achieved with anti-static floor mats placed under chairs, behind counters, and in other locations where people walk and come in contact with delicate electronic devices. They're also useful on top of connecting cables (between devices and to communications modems) as a means of preventing discharges into the cables. Conductive anti-static mats must be connected to a good ground to be effective, usually to the center screw of a grounded wall receptacle. Sitting or standing on such a mat then grounds static build up while walking to the installation and prevents build-ups while moving around at the equipment.

POWER DISTURBANCES

Power disturbances are the biggest pain of all, both to stand-alone computer operations and network communications. Even if the lights don't go off completely, low voltages (brownouts), surges, spikes, line noise, and other problems wreak havoc

WEAR AND TEAR

with computer operations and data transmissions. Basically, there are three major types of disturbances: power outages, voltage fluctuations, and line noise. All are disruptive, and all can be destructive.

Did you know that you are the one responsible for providing appropriate power and installing protective devices? Did you know that failure to condition your power lines can be considered negligence and cause for voiding warranties or canceling service contracts? Did you know that neither the manufacturer nor the retailer is responsible for problems resulting from your failure to meet power specifications?

It's common to receive line power above or below the maximums and minimums specified for a piece of equipment. If the specification calls for 115 VAC nominal with a maximum of 130 VAC, utility lines carrying 131 VAC are "out of spec," and it's your responsibility to detect the condition and do something about it.

Most power disturbances originate on the utility lines, resulting from causes as diverse as power switching, damage to underground cables, lightning strikes on lines and transformers, auto accidents knocking out distribution boxes, and so on. Of course, you can overload a circuit and blow a breaker or fuse, create interference or noise with appliances, or generate other problems of your own, but the most serious and the most difficult to control originate outside your installation.

Effects

One effect of a power outage or blackout is a sudden shutdown of the computer system, losing programs and data in memory and whatever results have been computed to that point. That's typical of interruptions lasting more than a few power cycles. Shorter interruptions "glitch" the computer, causing erroneous results or data transmissions, altering data or programs, trashing displays or printouts, disconnecting a network link, and so on.

But those are just operating errors, and much worse can happen. A high-voltage surge can figuratively "fry" equipment, burning out circuits or entire boards. Internal power supplies can burn out. Mechanical parts can jam, with the possibility of severe damage. Disks can crash, possibly damaging heads or magnetic media. Even if the magnetic media isn't physically damaged, stored data may be erased or altered. Files may be irretrievable.

Not only are power disturbances damaging to the system, you can't predict, prevent, or control them. About all you can do is spend the time and money to protect the most vital components and operations against them.

Preventive and remedial steps

You are the only one who can determine how much protection you can afford, how much your applications justify, and which of several alternatives are suitable. For instance, recreational users might only be able to afford and justify protection against voltage spikes, which is relatively cheap and obtainable with "surge protectors" costing upward of $25. Other users may want to guard against both surges and electrical noise, usually requiring a combination of surge protection and line "isolation" in devices costing between $60 and $200.

On the other hand, protecting against short-duration power interruptions and brownouts using standby power supplies can cost from $250 to $1,200 for small personal computers and many thousands for large-scale professional systems. Business users with critical applications may have to spend considerable sums to achieve multi-purpose protection against numerous disturbances. Yet, those expenditures may be well justified by eliminating equipment damage and losses of vital data.

The number of available power-conditioning devices is staggering. At the low end of the price scale are inexpensive in-line surge suppressors and noise filters that guard against sudden increases in line voltage and against electrical noise that might be imposed on lines by appliance motors and other interfering devices. Effective for mild disturbances on residential and commercial power lines, they do not safeguard equipment or data from outages, and most give limited protection against severe surges or extreme noise typical of industrial facilities.

Heavy-duty devices are available at added cost, providing improved protection against severe spikes and surges while eliminating potential electrical interactions between devices plugged into the individual sockets. Actually, if one's budget can bear the costs, such "magnum" suppressors and isolators are preferable to the inexpensive home units. Even if you use your computer strictly for at-home entertainment, an "industrial

Continued on pg. 48

BUYER'S GUIDE TO MICROCOMPUTER CARE & MAINTENANCE PRODUCTS

This is a partial list of companies providing useful products for the care and maintenance of microcomputers. It is not a complete list of all suppliers, and should be considered a sampling only. Users should contact these and similar companies for catalogs, product specifications, and other information.

ALF PRODUCTS, Inc., 1448 Estes, Denver, CO 80215, (303) 234-0871.
Penulticopy ($34.95)—high-speed high-reliability self-formatting copy program for duplicating and backing up Apple DOS diskettes. Not a nibble copier so will not work on copy-protected diskettes.

ADVANCED MICRO TECHNIQUES, 1291 E. Hillside Blvd., Suite 209, Foster City, CA 94404, (415) 349-9336.
Dpatch ($195.00) — a disk-recovery utility program for CP/M systems incorporates direct disk and file alteration, recovery from input/output errors, recovery of erased disk files, and certification of disk surfaces.

BILLINGS McEACHERN, INC., 402 Lincoln Centre Drive, Foster City, CA 94404, (415) 570-5355.
GS-1 and GS-2 Power Line Monitors ($345.00 and $975.00) — plus in monitors to identify power line distrubances such as surges, high and low voltages. GS-1 uses indicator lights for various types; GS-2 includes a paper-tape recorder that logs time and type.

BLAT R&D CORPORATION, 8016 188th Street S.W., Edmonds, WA 98020, (206) 771-1408.
Badlim ($73.00)—diskette surface certification program for CP/M systems. Locates and locks out bad sectors to prevent loss of data due to recording over sectors that can't be read back.

CENTRAL POINT SOFTWARE, Inc., P.O. Box 19730-203, Portland, OR 97219, (503) 244-5782.
Copy II Plus ($39.95) — Apple II disk utility for backing up copy-protected diskettes, certifying disk surfaces, recovering erased files, altering files, etc.

COMPUTER CASE COMPANY, 5650 Indian Mound Ct., Columbus, OH 43213 (614) 868-9464.
Heavy-duty carrying cases for small computers and peripherals. Cases provide protection for delicate equipment while being transported. Various models are available at differing prices in accordance with equipment type and size.

CONTROL TECHNOLOGY, INC., 8200 No. Classen Blvd., Suite 101, Oklahoma City, OK 73114.
Reserve power supplies for small computers such as the Apple II and IBM PC. The older APS-5 ($389.95) is being replaced by a new, improved unit. These products are specific to individual computers, connecting between the internal power supply and motherboard. They offer some of the longest "hold-up" times of any units available for backup against power failures.

CREATIVE COMPUTING SOFTWARE, 39 East Hanover Ave., Morris Plains, NJ 07950 (201) 540-0445.
Disk Doctor ($19.95) — Apple II disk utility program to modify diskette sectors and certify diskette surfaces.

DIGITAL MARKETING, 2670 Cherry Lane, Walnut Creek, CA 94596, (415) 938-2880.
File Fix ($100.00)—general purpose CP/M disk utility system including erased file recovery, relocation of files between user areas, forged linkages to access programs in other user areas, and a number of other useful utilities.

DYMARC INDUSTRIES, INC., 21 Governor's Court Baltimore, MD 21207, (301) 298-9626
Clipstrip and Clipper — low cost in-line power conditioners for surge suppression.

ELECTRONIC SPECIALISTS, 171 South Main Street, Natick, MA 01760, (617) 655-1532.
Various power conditioners across a wide range of prices. Products include surge suppressors and noise isolators for light-duty applications and "magnum" versions for critical applications and severe disturbances.

FIBERBILT/IKELHEIMER-ERNST, INC., 601 West 26th Street, New York, NY 10001, (212) 675-5820.
Light- and heavy-duty cases for protecting equipment while transporting small computers and their peripherals. Prices vary according to the brands of equipment, number of components housed, etc.

GOULD, INC., 2727 Kurtz Street, San Diego, CA 92110, (714) 291-4211.
Deltec uninterruptible power supplies. Numerous types of true UPS units, voltage regulators, and similar units for virtually any size business and professional system. Prices range upward from several hundred dollars depending on the outputs and holdup times needed.

HUTTON INDUSTRIES, INC., P.O. Box 1413, Tacoma, WA 98401.
QWK Cover ($12.95) — keyboard cover for the Apple II. Offers good dust protection and effective spill protection while system is not in use.

INMAC, 2465 Augustine Drive, Santa Clara, CA 95051, (408) 727-1970.
Extensive line of computer and system care products including keyboard covers, cleaning kits, surge protectors, line monitors, etc. The Inmac catalog is a "must have" item for all computer owners and users.

INNOVATIVE COMPUTER PRODUCTS, INC., 18360 Oxnard Street, Tarzana, CA 91356, (213) 996-4911.
Extensive line of Perfect Data Computer Care Products at economical prices. Offerings include video cleaning kits, anti-static kits, disk-drive cleaning kits, and complete microcomputer care kits.

KENSINGTON MICROWARE, LTD., 300 East 54th Street, New York, NY 10022, (212) 490-7691.
System Saver ($89.95) — cooling fan with in-line power conditioning (surge suppression) for Apple II computers. Particularly useful for protecting against excessive heat buildups in heavily equipped Apple Computers.

LADCO DEVELOPMENT CO., P.O. Box 464, Olean, NY 14760.
Ramlock ($435 to $945)—reserve power supplies (switching type) available in several sizes and prices for different system requirements and current drains.

LAST ELECTRONICS, INC., P.O. Box 1300, San Andreas, CA 95249, (209) 754-1800.
Plexa-Lok ($19.95, approximate) — transparent keyboard shields for several popular computers. Units slip over keyboards to provide dust reduction and spill protection. Ventilation allows use for tamper protection while computer is operating.

MARK FOUR IMPORTS, P.O. Box A, San Gabriel, CA 91776, (213) 287-9945.
Cool-Mark II ($34.95) — internally mounted cooling fan for the Apple II. Provides forced-air cooling in applications where external fans may be unusable or undesirable.

MASTERWORKS SOFTWARE, INC., 1823 Lomita Blvd., Lomita, CA 90717, (213) 539-7486.
MasterDisk and MasterDos ($29.95 ea.)—disk and disk operating system utilities for file and media care or maintenance.

MICRO-WARE DISTRIBUTORS, INC., P. O. Box 113, Pompton Plains, NJ 07444.
Nibbles Away II ($69.95)—"nibble copier" for making backups of copy-protected Apple II software packages.

NATIONAL FIELD SALES, 2660 W. Chester Pike, Broomall, PA 19008, (215) 59-1004.
Stedi-Watt Jr. — Power conditioning equipment for medium-duty installations. Numerous models at various prices are available.

NIKROM TECHNICAL PRODUCTS, 25 Prospect Street, Leominster, MA 01453, (800) 835-2246.
Master Diagnostics + Plus ($75.00) — combination of diagnostic software for the Apple II, a disk-drive cleaning kit, and other cleaning products. Software provides a thorough shakedown of the computer system components.

OMEGA MICROWARE, INC., 222 So. Riverside Plaza, Chicago, IL 60606, (312) 648-4844.
Apple II disk utilities. Locksmith ($99.95)—is a "nibble copier" for generating backups of copy-protected software. The Inspector ($59.95) and Watson ($49.95) provide extensive disk-file manipulation routines to fix data, recover files, examine storage areas, etc.

OMNI COMMUNICATION, INC., R.D. 3, Box 200, Jackson, NJ 08527.
Blitz Bug ($24.95)—plug-in line conditioner claiming to eliminate high-voltage spikes and provide protection from damaging electrical transients.

PANAMAX, 150 Mitchell Blvd., San Rafael, CA 94903, (415) 472-5547.
Power conditioners (fused surge suppressors) for small computer installations. Several models are available for different power requirements and at different prices.

R.H. ELECTRONICS, INC., 566 Irelan, P.O. Bin CC, Buellton, CA 93427, (805) 688-2047.
Super Fan II ($69.00) — cooling fan for the Apple II; a high-priced version ($125) includes power-line conditioning (surge and noise protection), Guardian Angel ($595.00)—standby in-line power supply for the Apple II and other small computers for several minutes of holdup power in the event of a power failure, low-voltage condition, etc.

RKS INDUSTRIES, INC., 4865 Scotts Valley Drive, Scotts Valley, CA 95066, (408) 438-5760.
Surge Sentry ($89.50 to $132) — power-surge protection for computers and peripherals.

SAFT AMERICA, PORTABLE BATTERY DIVISION, 931 No. Vandalia Street, St. Paul, MN 55114, (612) 645-8531.
Switching-type standby power supplies in 200-watt ($489.00) and 400-watt ($689.00) outputs.

SOLA, 1717 Busse Road, Elk Grove Village, IL 60007, (312) 439-2800.
True uninterruptible power supplies in various sizes for almost any type of popular business or professional microcomputer installation.

SENSIBLE SOFTWARE, INC., 6619 Perham Drive, West Bloomfield, MI 48033, (313) 399-8877.
Back It Up II ($60.00)—Apple II "nibble copier" for backing up protected or uncopyable commercial software. Disk Recovery ($30.00) is a general-purpose disk utility for recovering from disk errors and restoring erased files.

SUN RESEARCH, INC., Box 210, New Durham, NH 03855, (603) 859-7110.
Mayday standby power supplies. An extensive line of sizes up to 600 watts and prices in square-wave and sine-wave switching supplies for protection against power failures.

SUPERSOFT, INC., P.O. Box 1628, Champaign, IL 61820, (217) 359-2112.
Diagnostic II ($125.00) is a general-purpose system diagnostic software package for CP/M systems, providing tests of the CPU, memory, disks, and peripherals. Disk Doctor ($100) is a disk-error recovery system for restoring damaged and erased files but doesn't work with double-sided drives. Disk Edit ($100) is a general-purpose disk utility for accessing and changing information on the media.

SYMPATHETIC SOFTWARE, INC., 9531 Telhan Drive, Huntington Beach, CA 92646.
Disk Prep ($25.00) — an Apple II program to test and prepare disk surfaces prior to use, thereby locking out bad sectors and surface flaws.

TEXWIPE, 51 Prospect Place, Hillsdale, NJ 07642, (201) 327-9100.
A wide assortment of cleaning and care products for nearly any budget and application. Their catalog is a worthwhile reference for all computer installations.

3M COMPANY, 3M Center, St. Paul, MN 55144, (612) 733-1110.
Static control mats in various sizes and at various prices. Also provides a portable anti-static field service kit for static protection while working on equipment.

TOVATECH, 1903 Fordham Way, Mountain View, CA 94040, (415) 968-0392.
Ventop ($45.00) — slotted replacement cover for the Apple II replacing factory-supplied cover to provide convection cooling of the chassis, particularly over the expansion connectors where heat buildups result from plugging in extra boards.

XPS, INC., 323 York Road, Carlisle, PA, (800) 233-9512.
Apple-Cillin II ($49.95) — collection of extensive diagnostic routines for Apple II systems. It includes tests of motherboard and add-on memory, the CPU, the disk drives, the keyboard, the display, and other components.

GETTING THE MOST OUT OF VISICALC

by William J. Lynott

Dodd Powell taught himself to write programs in BASIC for his new personal computer. "It was a very big investment in time and effort," he says now, "and what I didn't realize then was that I needn't have bothered."

Powell is a small business owner who uses his TRS-80 Model II to help with financial projections, budgeting, and general "number crunching." After he managed to write a few programs of his own for these purposes, a friend introduced him to VisiCalc. He hasn't written or used any of his own programs since. "VisiCalc," he stoutly proclaims, "can do *everything*."

The truth, of course, is that VisiCalc can't do "everything." It has, in fact, several unfortunate limitations, the most notorious of which is its inability to provide variable width columns within the same worksheet. While column width can be set anywhere from three characters to more than will fit on your monitor screen, every column on the worksheet will be the same width.

What it does do, however, it does with mind-boggling ease. If it has to do with numbers, chances are it's duck soup for VisiCalc. The result is a growing legion of avid boosters.

Says one admirer, "The automobile industry had its '55 Thunderbird; the record industry had 'White Christmas;' the movies had Greta Garbo; and the software industry has VisiCalc. Each one an original, a classic, and destined to set the standards by which others would be measured."

Of all the testimonials to VisiCalc, however, the most persuasive may be the continuing series of discoveries of novel new uses and applications being reported by users the world over. The failure of the original editions of the VisiCalc documentation to even mention many of these seems to stand as silent evidence that even the program's brilliant authors were not fully aware of the versatility of their new creation.

The basic purpose of VisiCalc is to provide a sort of electronic worksheet —one that looks and works very much like those old accounting sheets with rows and columns in which any manner of labels and calculations may be entered. With VisiCalc and a personal computer, however, formulas and entries may be changed at will to provide a near-magical" what if" capability. While the manual provided with the program contains an excellent tutorial that will have you formatting your own worksheets after only a couple of hours and a few cups of coffee, the real fun begins when you begin to discover some of those little tricks that aren't mentioned in the documentation.

Take the matter of labels, for example. VisiCalc assumes that you are entering a label when you begin with an alpha character. Sometimes, though, a label may begin with a numeric—the year "1983," for example. Since this looks like a number to the computer, you must signal that you are typing a label and not a numerical value. The instructions tell you to do this by first typing a single quotation mark ("). This is your signal that what follows is a label regardless of whether it begins with an alpha or numeric character. Some users have found it faster and easier to hit "q" and then "esc" instead. These two keys are located close together on the upper left hand corner of the keyboard. Try it; it works.

(Note: This article was prepared using an IBM Personal Computer and version 1.10 of VisiCalc. Different versions and/or other computers may require minor changes in some procedures).

Errors on purpose

Overlays have proven to be another fertile ground for innovative VisiCalc users. An overlay occurs when a new worksheet (I'll call them templates from now on) is s/loaded without first clearing the screen (/cy) of the one currently residing in memory. When this happens, you wind up with a mish-mash combination of both templates on your screen. VisiCalc instructions rightfully caution against this development with a stern reminder to always clear the old template from the screen and memory with /cy before loading a new one.

What the instructions do not point out, though, is that this phenomenon, once understood, can be put to good use. Here's what happens when you load one template on top of another: At any grid coordinate (cell) where the new template has not entry, the template on the screen will be unchanged. That is, if B15 on the old template contains the label "SALES," and B15 on the new template is blank, B15 on the screen will be undisturbed. If, however B15 on the new template contians a formula, or any other entry, "SALES" will be erased and the new entry will take its place .

Now let's say that you have two dozen identical templates that you are using to compile sales reports for each of your salesmen. You discover some errors in the master template — perhaps five different cells have to be changed. Normally, you would have to load up each of the 24 reports and re-type the corrections into each location—more than a hundred corrections and lots of opportunities for error. But wait. There's an easier way.

Load up the master template and note the exact grid coordinates requiring changes. Now, clear with /cy and create a new template containing entries only in the affected locations. Give your new template a name, /ssave it, then clear the screen.

Now load the first individual salesman's report, load the new template with corrections right on top of it, /ssave the resulting combination, /cy and repeat for each template that must be changed. The result: a fast job with little chance for error.

By the way, this same principle can be used to add a new section to any number of existing templates. Just create the new template using only the grid locations that you wish to add, and follow the above sequence.

These are but two simple examples of how overlays can be put to constructive use; but they serve as good illustrations of how a little free-wheeling thinking can greatly expand the original boundaries of the VisiCalc program.

Time saver

If the operator doesn't happen to remember the lower right hand coordinate when printing a large template, it is necessary to scroll across and down the entire worksheet until the location is found. To avoid that time-waster, just get in the habit of recording both the file name and the lower right hand coordinate right on your worksheet where it won't print out.

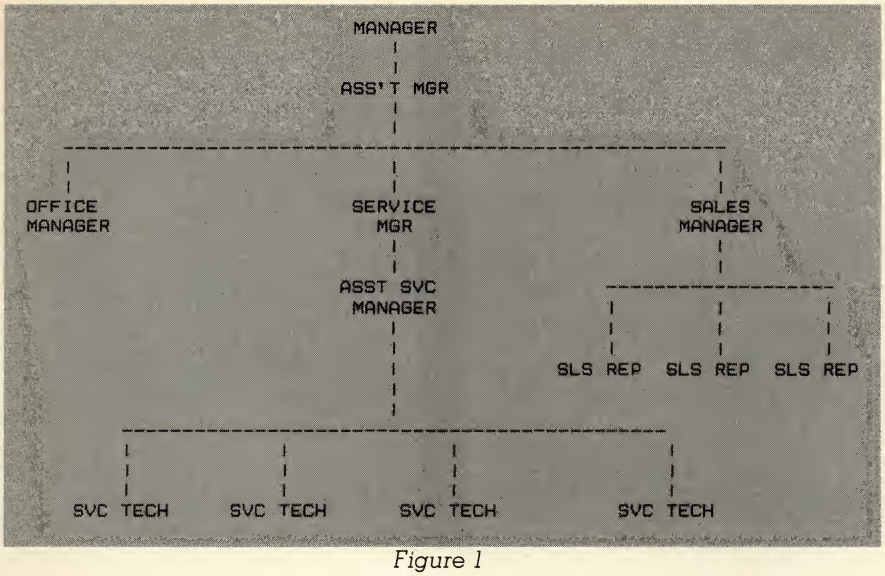


Figure 1

Here's how:

Put the cursor on A1 (which is usually blank. If not, insert an extra row at the top of the template to make it blank). Use the space bar to space beyond the set column width, enter the information you want to record, and hit "enter." The information will not appear in A1 but will be neatly displayed on the prompt line whenever you return the cursor to A1 as you would do to print or save—and it won't be printed out on your hard copies.

VisiCalc charts

The inviting symmetry of VisiCalc's format has proven to be a delicious temptation for people who need to labor over such things as organization charts or complex wiring diagrams. Although taking advantage of the quick and easy VisiCalc way to produce neatly labeled diagrams of that sort may not measure up to the job that can be turned out by a skilled draftsman, it sure beats the hours of trial and error typing that most of us would require to turn out an acceptable product.

The organization chart in figure 1 was turned out as a VisiCalc worksheet in only a few minutes. Any sort of symmetrical layout requiring entries connected by vertical and horizontal lines can be produced in this manner by anyone with a little imagination and a few minutes to make the necessary keyboard entries. At least one electrical contractor uses VisiCalc in this way to turn out quick and easy wiring diagrams.

Text files for VisiCalc

For the more technically inclined, the mystery of just how VisiCalc stores the templates you create holds the key to an almost unlimited source of innovative uses for the program. Basically, VisiCalc is not thought of as a means for creating and storing text files; that is, files that contain instructions to the computer which are executed when the file is loaded. Instead, instructions are given to the computer and executed by VisiCalc as you type them in one at a time on the keyboard.

The fact is, though, that VisiCalc creates a text format each time you /ssave a template. When you load it again, the computer reads the text file, executes it, and recreates your template on the screen and in memory. Figure 2 is an exact copy of the file created by VisiCalc when I /ssaved the chart shown in figure 1.

If it looks suspiciously like program language, it is; but relax. You don't have to be a programmer to understand it, or to put it to use.

The secret to using what I call "visitext" is in a sadly neglected part of the VisiCalc documentation that deals with the print-to-file function. When you give VisiCalc a "print" command, you are offered two choices: print to the printer (/PP), and print to file (/PF). When you select the second option, you "print" a file on disk that will automatically be assigned the suffix ".PRF." It is this procedure that allows you to use visitext to create your own text files which will be used by VisiCalc to put your own ideas to work.

First, a look at how VisiCalc executes the commands in a .PRF file. Each line in figure 2 contains a command and is the equivalent of one line in a program. VisiCalc stores the format for a template that you have created in reverse order; that is, it reconstructs the worksheet beginning at the lower right hand corner and ending at the upper left.

VisiCalc users will recognize most of the language immediately. The first line in figure 2 instructs the computer to... go to G33, (enter), type the label "Figure 1." The next line says to go to

```
)G33:"Figure 1
)G26:"TECH
)F26:"      SVC
)E26:"TECH
)D26:"      SVC
)C26:"SVC TECH
)B26:"TECH
)A26:"      SVC
)G25:"|
)E25:"|
)C25:"     |
)B25:"|
)G24:"|
)E24:"|
)C24:"     |
)B24:"|
)G23:"|
)E23:"|
)C23:"     |
)B23:"|
)F22:/--
)E22:/--
)D22:/--
)C22:/--
)B22:/--
)D21:"     |
)D20:"     |
)H19:"SLS REP
)G19:"SLS REP
)F19:"SLS REP
)D19:"     |
)H18:"     |
)G18:"     |
)F18:"     |
)D18:"     |
)H17:"     |
)G17:"     |
)F17:"     |
)D17:"     |
)H16:"     |
)G16:"     |
)F16:"     |
)D16:" MANAGER
)H15:"-----
)G15:/--
)F15:"     -----
)D15:"ASST SVC
)G14:"     |
)D14:"     |
)G13:"     |
)D13:"     |
)G12:" MANAGER
)D12:"   MGR
)A12:" MANAGER
)G11:"  SALES
)D11:" SERVICE
)A11:" OFFICE
)G10:"     |
)D10:"     |
)A10:"     |
)G9:"     |
)D9:"     |
)A9:"     |
)G8:"-----
)F8:/--
)E8:/--
)D8:/--
)C8:/--
)B8:/--
)A8:"     -----
)D7:"     |
)D6:"     |
)D5:"ASS'T MGR
)D4:"     |
)D3:"     |
)D2:" MANAGER
/W1
/GOC
/GRA
/GC9
/X)A1:)A1:
```

Figure 2

ABC CO.
SALES REPORT JANUARY 1983

REGION	MONTH	BUDGET	DIFF.	YTD	BUDGET	DIFF.
#1	10500	10000	500	10500	10000	500
#2	9700	10000	-300	9700	10000	-300
#3	11000	10000	1000	11000	10000	1000
#4	11650	10000	1650	11650	10000	1650
#5	10098	10000	98	10098	10000	98
TOTAL	52948	50000	2948	52948	50000	2948

Figure 3

ABC CO.
SALES REPORT FEBRUARY 1983

REGION	MONTH	BUDGET	DIFF.	YTD	BUDGET	DIFF.
#1	10200	10500	-300	10500	10000	500
#2	10050	10500	-450	9700	10000	-300
#3	11633	10500	1133	11000	10000	1000
#4	10760	10500	260	11650	10000	1650
#5	9986	10500	-514	10098	10000	98
TOTAL	52629	52500	129	52948	50000	2948

Figure 4

G26, (enter), type the label "TECH," and so on, until the entire template is reconstructed. (VisiCalc accepts the colon the same as the enter key). While this particular template contains only labels, we shall soon see how formulas may be used as well.

Each time you create an original worksheet on VisiCalc, it is converted to the form in figure 2 when you save it with the /SS command. Then, each time you reload it, the instructions are carried out a line at a time until your worksheet is back on the screen again. Now that you know that, it follows that you can create your own "text" files using VisiCalc language to obtain some special effects. Here's one idea:

It wasn't long after VisiCalc's release that users began to ponder over the problem of how to maintain a running total that would be automatically updated when the new month's figures are typed in over the old. An example would be a monthly sales report that carries both month and year-to-date figures. Consider figure 3.

This fictional sales report contains all the sales manager needs to know about performance in each of the company's regions during the month of January. Monthly figures for both the budget and actual are entered by the operator, and formulas in the difference columns automatically provide that information. Now let's see what happens when it's time to prepare the February report.

With the new monthly figures for February now available, we need only load up our previously saved "January" and type the new month's figures right on top of the old ones — being sure to remember to change the January label to February. That's exactly what we did in figure 4. Everything worked fine in the month columns since the latest entry in each location is what remains; but look at what happened on the year-to-date side — nothing. Why weren't the YTD figures updated? Why didn't we simply put formulas in the YTD locations calling for the existing YTD figures to be added to the new monthly figures as they are entered?

Sorry, it's not that easy. A formula that asks a figure to add itself to another figure whenever the other figure is changed creates what is called a circular reference. The VisiCalc manual contains an excellent explanation of circular references and why they won't work, so we won't go into them here. But be assured, all is not lost. This is where visitext comes to the rescue.

Figure 5 shows a text file created for the purpose of providing an easy means to generate an automatic, error-free update of YTD figures. Take a look at the first entry. It instructs VisiCalc to: go to F6; freeze the figure in that location (that's the purpose of #); and then add it to the figure in B6. The result is a new YTD figure in F6. The second group of line does the same thing for YTD budget figures, and the last line provides the icing on the proverbial cake. See what it does? It send the cursor to F2 (where you have recorded the month), and blanks out that location as a reminder to you to change the entry to the name of the current month.

Figure 6 shows what happens when the visitext file is loaded directly over figure 5. The cursor has happily blanked out F2 waiting for the current month to be typed in, and all year-to-date figures have been updated.

When the March figures are available, it will be necessary only to load up February (which you must be sure to /ssave), enter the new monthly figures, load up your YTD.PRF file right on top of it, and remember to type in "March."

Here are some important things to remember when creating a visitext file: All lines must be entered in the same column. All entries must be labels (hit Q/esc). When complete, the file must be saved with the print file command (/PF). When loading, you must add the suffix .PRF to whatever name you have given the file. By the way, it's also a good idea to save your visitext file with

```
)F6:#+B6#
)F7:#+B7#
)F8:#+B8#
)F9:#+B9#
)F10:#+B10#

)G6:#+C6#
)G7:#+C7#
)G8:#+C8#
)G9:#+C9#
)G10:#+C10#
)F2:/B
```

Figure 5

ABC CO.
SALES REPORT 1983

REGION	MONTH	BUDGET	DIFF.	YTD	BUDGET	DIFF.
#1	10200	10500	-300	20700	20500	200
#2	10050	10500	-450	19750	20500	-750
#3	11633	10500	1133	22633	20500	2133
#4	10760	10500	260	22410	20500	1910
#5	9986	10500	-514	20084	20500	-416
TOTAL	52629	52500	129	105577	102500	3077

Figure 6

/SS so that you'll have a way to review and edit it later.

This, of course, is only one very elementary way in which the visitext concept can be put to use. A little imagination and practice should generate a flow of new ideas relevant to your own interests and needs.

WHO NEEDS A TYPEWRITER?

Ever find yourself in need of a quick and easy word processor? If so, VisiCalc can come to the rescue. It won't function like a true word processing program, of course; but it won't cost five hundred bucks either. Here's all you have to do.

Set column width to 38 if you have a 40 column display, or 78 if you have an 80 column screen. Now, simply start out on row one and type away. There will be no automatic wraparound or bell when you reach the end of a line, so you'll have to watch that yourself. At the end of each line, just move the cursor down one line and continue.

If you want to indent your paragraphs, you'll have to insert the leading spaces by first hitting Q/esc and then using the space bar for the number of spaces desired. The same goes for any special type of indent such as you might use for a chart or table.

Depending on the specific model computer you are using, you may or not have upper and lowercase capability, and the end product won't compete with what can be done with a full function word processor. However, such important features as the ability to type directly over errors and to fiddle with the text until it's letter perfect work every bit as well as they do with the real thing. For rough drafts or any copy that you must bang out in a hurry, give it a try.

It should be plain by now that the VisiCalc manual is only a doorway to the wide world of potential VisiCalc applications. The space limitations of an article such as this allow but a brief sketch of a much more detailed picture. One of the program's most valuable features is the built-in versatility that allows each user to exercise his own imagination in developing new ways to solve old problems.

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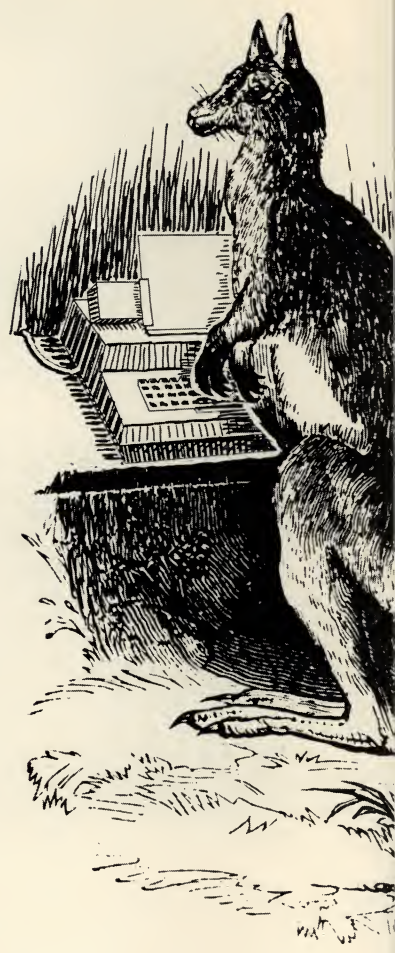
ZARDAX: A DOWN UNDER VIEW OF WORD PROCESSING

Reviewed by Ernest E. Mau



"Zardax." Now there's a strange name — you won't find it in the dictionary or encyclopedia, so don't bother looking. It's the trademark of a surprisingly capable word processor for Apple II and Apple II Plus computers, a word processor designed by Computer Solutions of Queensland, Australia and imported into the United States by Action-Research Northwest. It's also a name with which you should become familiar if you own or contemplate purchasing an Apple for any kind of serious word processing tasks.

To put my statments into perspective, it's first necessary for you to know a little about how I use word processing. So let me begin by saying that I'm a professional free-lance writer. Writing is my business and my hobby — my livelihood and my pleasure. With three computer systems, I spend up to 18 hours a day, seven days a week pounding a keyboard to churn out thousands of pages each year for technical instruction manuals, magazine articles, book manuscripts, reports, and letters.

Obviously, I need an efficient and effective word processor that's not going to waste my time or get in my way. For years, I've been relying on large S-100 bus computers running a processor called WordStar from MicroPro International. That's perhaps the most popular, most widely used, and most versatile word processor available for those machines. The problem is that is also spoils a user because it has an overwhelming number of features and suffers few limitations in what can be handled or formatted.

A year ago, I acquired an Apple II Plus computer for use in some special projects and as a second-line machine for my various writing enterprises. The acquisition led to some immediate problems, including the normal adjustment to a new machine, a new keyboard, and a whole new way of doing things. It also led to a need for a capable, reliable word processor that would not sacrifice all the features to which I had grown accustomed.

I set certain basic functional parameters for evaluating and selecting Apple word processors, among them:

1. Obtain as many editing and formatting capabilities as possible. Technical manuals and book manuscripts impose some rigorous and constantly changing formatting demands that must be met at any cost — either that or lose clients and sales.

2. Retain an ability to handle large documents without excessive file-handling problems. I found many processors capable of handling short letters and reports containing fewer than a dozen pages, but most made it far too difficult to handle documents of any substantial length.

3. Retain some method of previewing a fully formatted document on a video screen. Committing pages to paper without first checking the formatting is far too costly in lost time, wasted paper, and exhausted ribbons if I forget some command or overlook some requirement.

4. Use a "standard" disk format that doesn't preclude the use of add-on packages for things like spelling proofreading. The system also had to allow later transfers of text files on communication lines and between my own computers. I use hard-wired interfaces and special transfer programs to "talk" among three systems, plus modems to transmit documents to clients and publishers. Several capable processors had to be eliminated because the suppliers had invented their own file storage and disk handling techniques that got in the way of easy information transfer.

In a way, I suppose I was lucky. Working on serveal book projects about word processing enabled me to test and compare dozens of Apple word processors without having to commit to any one of them. As I mentioned, many were capable of handling small documents like letters. Others were suitable for long documents, but used odd disk formatting that made it difficult to move from one machine to another or even from one processor to another within the same machine. A few were dismissed out of hand as not having enough capabilities, while fewer still qualified for further testing.

By the time I obtained Zardax, I'd about decided I couldn't meet all my basic requirements in any processor for the Apple. Yet, I got a pleasant surprise — a package that met the requirements, did what the advertising claimed, and took little time to learn. It was an impressive combination.

A big surprise was that the programmers had not sacrificed program efficiency, features, or capabilities to achieve "user friendliness." The package is extremely friendly and easy to use, but without the blatant emphasis on that feature above all others that has invaded the software industry. Personally, I become suspicious of a program that makes a big deal of being user friendly. Too often, that's an attempt to cash in on popular advertising buzzwords and means features and usefulness have been eliminated to make room for instructions and help messages. Often, those same messages and help screens just get in the way of efficient program use for someone who's been through the procedures a few times.

Zardax, however, is friendly without being obnoxious about it. Instead of worrying about providing help messages and instructions to get around contorted procedures and complex operations, the programmers made the processor so simple

and straightforward it's difficult not to use it correctly. Therefore, the need for the user aids has been largely eliminated, making more room for effecting programming that does the work needed to process a document.

Zardax incorporates a wide variety of features, including most of the ones I'd grown used to with larger and more expensive processors. The most important are defined in the following paragraphs.

Logical key assignments like CTRL-R for right, CTRL-L for left, CTRL-U for up, and CTRL-D for down make it easy to move around in a document while editing. Normal movements are one character at a time across a line, a line at a time up and down, and a group of ten lines at a time up or down. Zardax lacks the ability to move across a line word by word, but does provide a method to move ten characters at a time (CTRL-SHIFT-L or CTRL-SHIFT-R). There are provisions for jumping to the beginning of text or end of text from anywhere in the document, but there aren't any for moving around one sentence at a time, one paragraph at a time, or to a pre-marked location in the text.

It has an extensive set of insertion and deletion operations, including nondestructive insertion without having to switch into a special mode. It does not provide text overwriting, so corrections and changes have to be performed by inserting new and deleting old materials. It does allow deletions of single character, from the cursor to the end of a paragraph, in a marked area, or all text at once. Blocks of text can be copied from one place to another, moved between locations (removed one place and inserted another), stored to disk, or inserted from disk. Therefore, "boilerplating" or "cut and paste" operations are relatively simple to accomplish.

A full set of heading and footing operations are provided, using either single- or multiple-line headings and footings as needed. Automatic page numbering is available, as is the ability to distinguish between odd and even numbered pages for positioning the headings and footings. However, there is a problem here. Though the processor can handle files of 15 or 20 pages at a time, it's still necessary to link multiple disk files for continous printout of book chapters and other long writeups. In linking, I've been unable to make Zardax carry the headings and footings from one file to another. Page numbering does carry over throughout the printout, but each disk file must provide its own heading and footing instructions. This can be an annoyance because it's easy to forget the instructions in second and subsequent files, so I set up a "merge" file with just that type of standard information and read it into each newly created file before I start typing.

Of course, there is the usual complement of formatting features, including the ability to force unconditional or conditional page breaks, do ragged or justified right margins, adjust line spacing, and so on. The processor can do fully formatted printouts, draft printouts without formatting, on-screen previewing, continous-paper or single-sheet printing, and so on. It even allows the user to specify the number of copies needed, starting and ending pages for partial printouts, etc.

Throughout, operation is simple. There is a need to configure the system before it can be used, but that's largely self-explanatory and isn't done again unless the hardware configuration changes. After that, it's only necessary to boot the system, choose a document name, and begin typing text. Like any word processor, practice is required to learn the proper use of formatting and control commands, but it doesn't take long. I recommended the program to one writer I know who had no previous contact with computers at all. He was producing professional manuscripts and seeing improved efficiency in his enterprise within three days of acquiring the system. For a novice to gain effective use that quickly indicates that the package has to be an easily used one.

The manual provides above average documentation of the features and controls, though it's written in what I consider a "semi-tutorial" format that follows a self-teaching approach. However, the manual makes a poor reference from which to retrieve specific information. The teaching organization tends to separate categories of information, and there's no index in which an item can be looked up alphabetically. A user needing specific information has to read through several pages of the table of contents and still may not find the item being sought. If the supplier were to provide either an indexed manual or separate tutorial and reference manuals, it would simplify things greatly.

I'm not going to bore you with elaborate explanations on each of the features and available operations. However, there are important points, some good and some bad, that do need explanation.

For one thing, Zardax is versatile enough to be usable on almost any Apple II system from a "bare bones" setup to a fully expanded and enhanced installation. There is a 40-column option for those who haven't gone to the expense of adding an 80-column display card. Meanwhile, it accepts most of the popular display cards like the Vista Vision-80, Advanced Logic Systems Smarterm, and Videx Videoterm to name just three. It works well whether the system has only 48K of memory or contains a 16K add-on to bring it up to a full 64K. In fact, Zardax recognizes the presence or absence of a 16K expansion, allowing larger documents to be processed as single files when the larger memory is available. Lowercase adapters aren't even needed because the 40-column display uses built-in high-resolution graphics to provide its own

character set while 80-column systems normally have lowercase provided by the screen control board.

Even though it works and works well, I don't particularly like the 40-column mode. The normal Zardax 40-column display puts mid-line dots on the screen instead of spaces, and I find that distracting. Supposedly, there's a way to override that and get normal spaces with the setup procedure, but I've had no luck doing it. Under 80-column operation, there's no problem, and spaces are treated as spaces.

Zardax works with any of several "shift-key" modifications, and is delivered with one of its own. The mod provided is a two-wire version with a header plug for a motherboard chip socket. The chip is removed, the header is inserted, the chip is installed in the header, and the wires are clipped onto the appropriate contact points (no soldering to endanger a warranty). It also works with the single-wire mod often used between the gameport socket and the keyboard, making it unnecessary to change existing modifications just to support this one software package.

Interestingly, Zardax is one of the few Apple word processors that supports the Videx Enhancer II. Many users install the Enhancer II to obtain lowercase with normal shift-key operation, keyboard buffering, self-repeating keys, and the full ASCII character set. Then they find that, at best, their word processors only tolerate the enhancer and don't use its features. At worst, some may not even run properly with an enhancer installed. Zardax is special, with the enhancer installed, all the buffering, key function, repeat, and lowercase operations are implemented. Where other processors might still require a wired shift-key mod, Zardax recognizes the Enhancer II modification and allows the separate wire or wires to be omitted or removed.

Something of special interest to technical and scientific users is that Zardax has a nonexpandable nonbreakable space feature. For those of you who don't know what that is, it's a special character that prints as a space during output but acts as a binding character during editing and formatting. To illustrate, an article like this contains frequent reference to the "Apple II." In preparing a manuscript, it may be undesirable to allow the "Apple" to be on one line and the "II" on another, so a nonbreak space would bind the two parts so they can't be split, yet it would appear as a normal space when printed.

This is important in dealing with metric numbers, since the international standards specify that commas are not used for grouping digits. Instead, a space is used, so a number like "1,000,000" would be typed as "1 000 000." Plain spaces would allow the number to be split between lines if it got too close to the end of one, but a nonbreak space such as that in Zardax keeps the number intact. The same feature is useful for formatting tables, controlling indents and outdents while justifying text, and so on. In technical and scientific work, this one feature can make or break a word processor.

One disturbing omission is that Zardax can't search for carriage returns. In other words, the find or find and replace operations won't locate or change the return characters. That may seem like an odd thing to pick on, but I often have occasion to locate something like three successive carriage returns where I only want two. I also need to find and eliminate excess returns when I transfer text files from one word processor to another or from one computer system to another (I have to put them in so I can do the transfer, then I have to take them back out on the receiving end). It would speed many of my operations if I could do a global search and replace for the ASCII return character, yet the lack of this capability is only an annoyance because I usually need it for only one pass through a document.

I'm not exactly thrilled with the "find and replace" feature, and I believe it would be improved by offering some options. As it stands, I can tell the system to find something in text and replace it with something else. When it finds an occurrence, I have the option of instructing it to make the change one time only, passing by without a change, or changing that and all further occurrences without asking me again. I also can drop out of the function, manually change something, and then resume searching. However, when I tell it what I want found, it locates every occurrence regardless of case (upper or lower), position in a word, etc. If I get in a hurry and accidentially tell it to replace all occurrences, I can mess up an editing pass by changing the wrong things. I'd much prefer to have some options to select things like match or disregard case, alter "whole word" occurrences only, and so on.

The one other serious objection I've had is that Zardax does not provide any hyphenation help. Of course, hyphens can be inserted manually, but I got used to a processor that provided assistance by stopping on eligible candidates, allowing me to hyphenate if I so wished, and then stored a conditional hyphen that would print only when it occurred at the end of a line. Again, it's not a serious problem and probably won't affect the average user's purchase decision one way or the other.

Except for these few minor flaws, I consider Zardax a jewel among the Apple word processors. It also has user-definable "glossary" keys for entering special or repetitive character sequences with a single keystroke. With suitable printers, it supports boldfacing, underlining, different type faces and sizes, special printer control characters embedded in text, and a host of others. It even has some limited mailing-list capabilities. Whenever someone asks me what I think of Apple processors, I recommend they at least take a look at this one before making a decision.

Overall, Zardax is an outstanding package. At a suggested retail price of $295, it's a bit more expensive than many other Apple II processors, but the cost is justified by the additional capabilities it provides. Yet, it's cheaper than many packages available for other machines. On an S-100 system, a good word processor can cost upwards of $500, while providing few additional features.

Now that I've whetted your appetite, you're probably wondering where you can go to check Zardax for yourself. In my locale, few computer stores stock the package, but they can order it if you're sufficiently persistent and demanding. Just be sure you get a money-back guarantee from the store in case you don't like it. Alternatively, you can obtain additional information or order direct from the U.S. supplier:

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Ernest Mau is a free-lance writer from Denver

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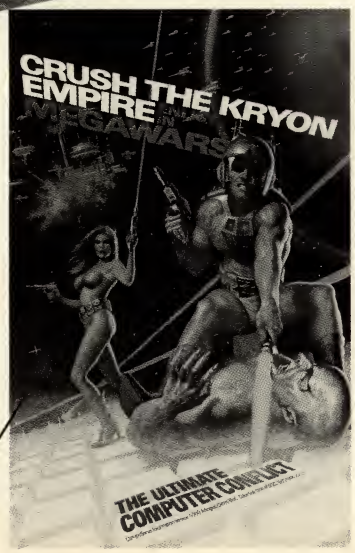

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BASIC FASTER AND BETTER AND OTHER MYSTERIES

by Louis Rosenfelder
IJG INC.
285 pp. $30.00

Reviewed by
J. Stewart Schneider
and Charles E. Bowen

Louis Rosenfelder and his group just may have written the best book on BASIC style available. *BASIC Faster and Better and Other Mysteries*, an entry to the TRS-80 Information Series, contains within its pages enough ideas to keep a BASIC programmer busy through the turn of the decade.

Rosenfelder covers, in 15 chapters and 11 appendices, such topics as making DEFFN really work, using arrays and strings to store relocatable machine language routines in "magic array" format, BASIC overlays, running programs that are larger than available memory, passing variables to and from programs, time and data calculation, formatted string input, searches and sorts, bit manipulation, data entry, and techniques to make keyboard and video do things that Fort Worth never anticipated.

Rosenfelder then goes on to give relocatable machine routines to accomplish those things not well attempted in BASIC and includes not only the assembly language listing, but also the POKE and "magic array" formats for each routine.

As if that weren't enough, Rosenfelder throws in workable, completely debugged BASIC subroutines with properly sequenced line numbers which can be stored on disk and merged into existing BASIC programs, or used as modules to construct an entirely new BASIC program.

To top it all off, he includes the listings for several very useful utilities and a chapter on Model II modifications to the routines contained in the book. He'll even sell you a 35-track single density disk containing all the routines from the book to save you typing time. The book is so good that it's almost embarrassing to review.

Now the bad news. As useful as all this information is, the book costs thirty bucks in soft cover and appears to have been printed by the same folks who brought you "My Weekly Reader" in grade school.

This is not a book that will be read once and placed on a shelf. It is a book that will be pored over day after day by anyone interested in BASIC programming. The publisher's decision to produce it so poorly bound is baffling. One suggestion would be to buy the book, cut the pages out with a razor blade, laminate them in plastic and put it in a three ring binder.

BASIC Faster and Better and Other Mysteries is not a primer of BASIC. Rosenfelder assumes that the reader already has a firm grasp of the language. The routines presented are bug free, as nearly as can be determined, and work as advertised, but little explanation is included on how they work. They are not so mysterious, however, that an experienced BASIC programmer should have much difficulty in understanding them.

In sum, *BASIC Faster and Better and Other Mysteries* will set the standards for BASIC programming style books for some time to come.

CREATE WORD PUZZLES WITH YOUR MICRO-COMPUTER

by Ernest E. Mau
Hayden Book Company, Inc.,
304 pp. $14.95

Reviewed by Earle Holland

It takes a certain type of person to excel in the world of word puzzles, someone who can find answers amid a murky bowl of alphabet soup and do so easily, much to the dismay of the rest of us.

It takes another kind of person to dive deep into the world of amateur computer programming and emerge happily fulfilled.

For those individuals who find themselves equally at home in both of these camps, Ernest Mau's new book should be as welcome as a box of Christmas cookies. It is not, however, a book for computer novices.

But that doesn't mean that it shouldn't be considered for the future. One of the few absolutes in the world of microcomputers is that sooner or later, everyone needs a new challenge. That's the time to reach for Mau's book.

Up front, it assumes a couple of things about the reader. First, one would have a familiarity with word puzzles and second, a familiarity with computers. Once those requirements are met, let the games begin.

Mau went to great lengths to unlock a treasure trove of programming, his own personal supply that allowed him to supply puzzle magazines with new challenges for the past three and a half years.

But instead of hoarding this private stock, he offers it on a silver platter to like-minded folks eager to try their hand at puzzlecrafting, as he calls it. The book offers 17 puzzle programs which produce 25 puzzles. The programs use Microsoft BASIC and, he points out, nearly any computer capable of running CP/M has access to that BASIC.

"Simply stated, this is not a book on 'how to make money with a computer,' " he writes. "Instead, this book should be viewed as a useful tool and a guide to some sophisticated programming techniques not often recognized or applied."

Mau must feel some larger purpose in writing a guidebook for computerized puzzlecrafting. Other authors have packaged sets of programs for whole hosts of purposes, simply doling them out like a cookbook doles out recipes. In many cases, such works leave would-be users in a quandry because their system is different than the one used by the author, and the result is a host of "minor modifications" which the user must figure out before the book can actually be useful.

Not so with Mau. The third chapter of this book, all 17 pages of it, deal specifically with potential modifications that might be needed depending on the system used. This is extra effort on his part, extra effort that ensures that the challenge will be in the puzzling, not in the programming.

For would-be cryptographers, crossworders and anagram addicts, this is a book to see.

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Industry Watch

WALL STREET PLOTTER

Dickens Data Systems, Inc. has introduced the Wall Street Plotter to provide the individual investor with visual tools designed for use in the technical analysis of financial securities, commodities and market averages.

Three separate type of price plots may be generated. The plotter is compatible with text files containing historical quotes, including those captured from CompuServe. Data files may be created in whole or in part with the editor, and the package is compatible with all of the popular graphics printer and plotter drivers.

For information of the Wall Street Plotter, which retails for $125, contact Dickens Data Systems, Inc., Suite A, 3050 Holcomb Bridge Rd., Norcross, GA 30071.

OPEN SYSTEMS DESIGNS LISA SOFTWARE

Open Systems, a company which designs, manufactures and markets application software for microcomputers, has developed several software products for Apple's newly announced Lisa™ computer.

Programs available are a Business BASIC interpreter, seven interactive accounting applications and a report writer running under Microsoft's XENIX operating systems in a multi-user environment on the Lisa computer.

For information contact Open Systems, Inc., 430 Oak Grove, Minneapolis, MN 55403.

COMPUCOVER

Looking for a cover-up? CompuCover can help you find a cover especially designed for your computer.

Covers are custom-fitted, static-free and come in tan or black cloth backed vinyl as well as deluxe clear plastic.

CompuCover has an extensive product line with hundreds of different designs on file; however, if a customer cannot find his particular piece of equipment, a custom cover will be designed.

CompuCovers start at $3.95, and they can be personalized with a logo.

For information contact CompuCover at P.O. Box 324, Mary Esther, FL 32569.

AMBIZ-PAK

Amway product distributors can now leave many routine tasks of their sales businesses to their computers. Blechman Enterprises has developed the AMBIZ-PAK, which consists of 14 programs on three cassettes compatible with the TRS-80 Models I and III.

The programs include order verification/generation (with 400 products and their prices in memory), monthly bonus calculation, monthly gross profit, distributor family tree, ledger, word processing and more.

Designed for beginners, the programs require 16K memory and contain no hidden code or protection schemes. The AMBIZ-PAK sells for $100.

For information contact Blechman Enterprises, Room 40, 7217 Bernadine Ave., Canoga Park, CA 91307.

NEW BRODERBUND VIC-20 GAMES

Broderbund Software has expanded its product line to now include the VIC-20.

Martian Raider™, a fast action, arcade style game, takes the player streaking through deep space, guiding intergalactic battle ships in an attack on Mars. The player tries to destroy Martian cities, while warding off ground-to-air missles, UFO's and meteorites.

Shark Trap™ pits the player against dastardly pirates and shark infested waters. The player's only protection is an atomic net used to snare the sharks.

Multisound Synthesizer™ transforms the computer into an easily playable musical instrument and white sound synthesizer. Five octave range, multiple voices and four programmable memories are featured. Special effects include beat, vibrato, decay, automatic drum and rhythm routines and spacy UFO sounds. It comes complete with instructions and songbook.

All three products retail for $19.95. For information contact Broderbund Software, Inc., 1938 Fourth St., San Rafael, CA 94901.

REFUNDERS RELIEF

Want to save money? Kensoft, a manufacturer of microcomputer programming software, can help.

Designed for the TRS-80, Models I and III, Refunders Relief will file all the necessary information on 60 different refund offers and 250 different proofs-of-purchase (POP) in just 16K.

For each offer, the program stores the offer title, a short description, whether or not a form is required, and POP data on up to three different products.

Refunders Relief sells for $15.95.

Available for the TRS-80, Model I is Leader Lopper. It requires just 17 bytes of run-time memory and will reduce cassette I/O time by up to 80 percent with average savings around 55 percent.

It is totally invisible to the programs and requires no software or hardware modifications.

Leader Lopper retails for $10.95.

For more information contact Kensoft, 2102-50th St., Kenosha, WI 53140.

THE BANK STREET WRITER

The Bank Street Writer,™ the first truly home-oriented word processing system, has been released by Broderbund Software.

Developed and heavily tested among students and young adults by Bank Street College and Intentional Educations, Bank Street Writer is designed to be easy for the whole family to use. Every function and command is fully and clearly prompted on screen.

Powerful features include universal search and replace, block move and "unmove," automatic centering and indent, inverse highlighting of text, word wrap and more. It requires no special hardware, displays upper and lower case and comes with a special tutorial that teaches word processing basics.

For further information on the Bank Street Writer, which retails for $69.95, contact Broderbund Software, Inc., 1938 Fourth St., San Rafael, CA 94901.

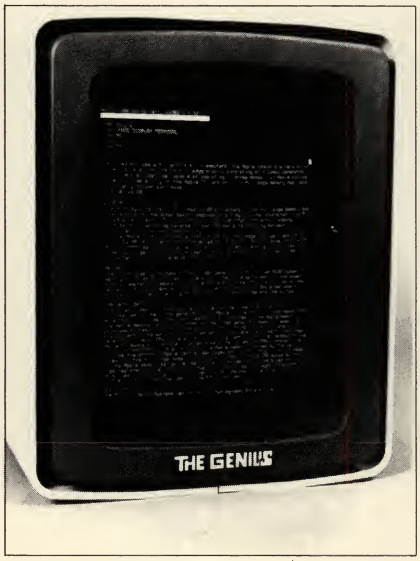
THE GENIUS RS-232 INTERFACE

Micro Display Systems, Inc. has developed The Genius,™ an RS-232 interface for full page display for most of the popular personal computers on the market.

The display is 57 lines by 80 characters and greatly enhances the ability of the operator to perform word processing, financial modeling and software development tasks.

The Genius display is available with white, green or amber phosphors and provides reverse video and flashing attributes. It lists for $1795.

For information contact Micro Display Systems, Inc., 1310 Vermillion St., Hastings, MN 55033.



INFOTORY FOR COMMODORE 8032 AND APPLE III

S.S.R. Corp. announced that INFOTORY, its Inventory Management System, is now available for the Commodore 8032 Professional Computer and the Apple III with Profile.

INFOTORY for the Commodore 8032 Professional Computer offers an item capacity of 4,000 inventory items with 38 fields of information for each item, including three (3) pricing levels. The Apple III version offers up to 20,000 inventory items and 36 fields of information for each item.

INFOTORY more than satisfies the requirements of inventory accounting and provides users with unimited information reporting capabilities through its unique data management sub-system, ANYREPORT. ANYREPORT allows the user unlimited flexibility in designing reports based on information associated with his inventory and the option to save those reports for future use.

Suggested Retail Price — $425.00.

Interested parties may contact S.S.R. Corp., 1600 Lyell Ave., Rochester, N.Y. 14606.

SOLVING THE MYSTERIES OF SCIENCE

Visual Materials, Inc. has introduced a new educational program, Solving the Mysteries of Science, a mastery learning science lesson for classroom use with the Apple II and Apple II e microcomputers.

Written primarily for students in grades seven through nine, the materials are textbook correlated. Each of ten general subjects offered consists of 24 lesson programs. Each lesson is contained on a single disk and clearly presents complex concepts through a series of questions and branched feedback explanations.

The series has been designed and written for independent study without need for teacher supervision.

For information contact Visual Materials, Inc., 4170 Grove Ave., Gurnee, IL 60031.

BASIC PROGRAMMING TOOLS

Synergistic Software has released a new utility program for the IBM Personal Computer. Entitled Basic Programming Tools, it is useful for anyone programming in BASIC.

The software package consists of a collection of utility programs, including a full screen editor, automatic conversion of symbolic line labels to line numbers, listing with cross references, removal of remarks and blanks and more.

Basic Programming Tools comes with the BASIC source code and full instructions both on disk and in the document. It retails for $120.

For information contact Synergistic Software, 830 N. Riverside Dr., Renton, WA 98055.

NEW LEGEND SOFTWARE

Legend Industries, Ltd. has released two new software products, the Legend Mailer and the Static RAM Card.

Legend Mailer utilizes the Disk Emulator for storage and retrieval of database type records. The program stores vital information such as name, address, phone number and notes and are sortable by any one given field.

The company has also developed an 18K Static RAM Card for the Apple II, II+ and II E computers. The card contains a battery back-up system to allow memory retention after power-down, enabling the user to store programs and/or special monitor routines.

For information contact Legend Industries, Ltd., 2220 Scott Lake Rd., Pontiac, MI 48054.

TORRICELLI EDITOR

Answer in Computers has added two new programs to its educational series: Torricelli Editor and Torricelli School.

Torricelli Editor is a courseware authoring program that allows educators to write their material without being experts in computer science. It is distributed with two sample courses for $295.

Torricelli School is a presentation program for courses written with the Editor program and features support of date and time, global variants and color.

It also allows interruption and resumption of course viewing, immediate feedback on accuracy of reply to test questions and percentile scoring. Torricelli School retails for $150.

Both programs can be purchased together at a discounted price of $395. For information contact Answer in Computers, 6035 University Ave., Suite #7, San Diego, CA 92115.

AVANT GARDE RELEASES IBM PC GAMES

From asteroids to laser warfare to air traffic control, Avant-Garde Creations has it all for game lovers who own IBM Personal Computers.

In Terran Jeopardy, the player pits his strategic skills against the Black Horde, placing the fate of the Earth in his hands. Menacing destroyer starships, radiation traces and asteroids could have devastating effects.

Air Traffic Controller puts the player in control of all the incoming traffic at a metropolitan airport. The player directs runway approaches and landings, monitors planes and radios commands to pilots. Occasional hijackings and UFOs add extra challenges.

Lazer Maze transports the player to the 24th century, a time when traditional warfare has become obsolete. Disputes are settled in a form of one-to-one combat using a laser gun.

Federation places the player in the command seat of a federation starship, with the mission of wiping out the merciless invading Drorn Drones.

All four games retail for $29.95 and require an IBM PC with Color Graphics Adapter.

For information contact, Avant-Garde Creations, P.O. Box 30160, Eugene, OR 97403.

NEW FROM AGDISK

Computerized worksheets for crop, livestock, machinery and general farm and ranch management are now available to help farmers and ranchers answer "what if . . . ?" questions. The AgDisk™ VisiCalc™ Templates automatically set-up all headings and formulas. They are ready for the user to provide specific information for analysis.

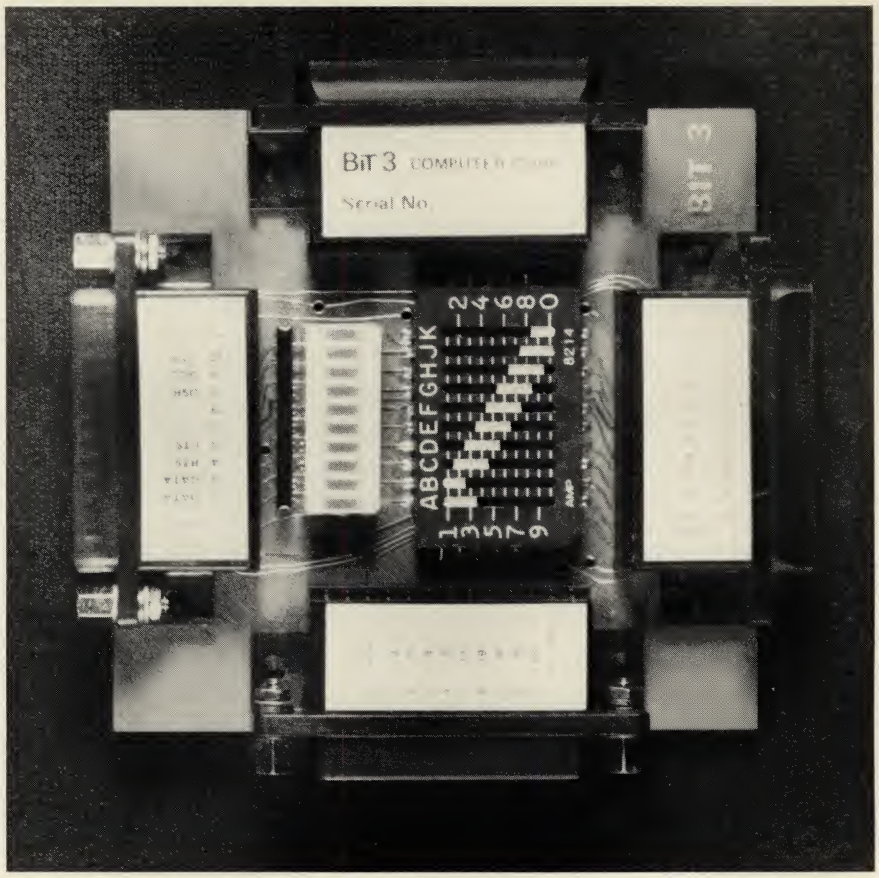
The versatile templates eliminate long hours of computer setup and can reduce hours of figuring with pencil, paper and pocket calculator. In doing so, they provide farmers and ranchers management insights with a minimal amount of work.

Prices, costs, interest rates, lengths of time, etc. can be changed on the computerized worksheets to let farmers and ranchers instantly see effects of changes in these factors on their operation before any capital is committed. For special management needs, template modifications can be made with minimal knowledge of VisiCalc programming codes.

Seven different AgDisk VisiCalc Template products are being introduced. Each product contains six to eight individual templates. The seven products include: Business Management (8 templates), Cow-Calf Herd Management (7 templates), Crop Management (5 templates), Feedlot Cattle Management (8 templates), Machinery Management (7 templates), Swine Farrowing Management (6 templates) and Swine Finishing Management (7 templates).

AgDisk products now are available through selected Apple, IBM, and Texas Instruments dealers including many Valcom, Farmland, ComputerLand and Team Electronics stores. Packages designed to run on Radio Shack, Commodore, and DEC microcomputers will be available later this year. Each AgDisk VisiCalc Templates product (6 to 8 actual templates) retails for $95 each.

More information on AgDisk VisiCalc Templates along with software for Farm Accounting, Financial Management, Corn/Soybean Management, Machinery Management, Market Charting and other AgDisk products can be obtained from Harris Technical Systems, Inc., 624 Peach Street, Lincoln NE. 68508.



BIT 3 CONNECTOR

Bit 3 Computer Corporation has introduced an RS232 connector matrix that permits the mating of any two RS232 connectors, eliminating the need to fabricate special cables or resolder existing cable wiring to achieve an interface.

Typical applications include use as a null-modem, converter for DCE/DTE pin conventions and diagnostic line monitor.

For information contact Bit 3 Computer Corporation, 8120 Penn Ave. S., Minneapolis, MN 55431.

BRODERBUND RELEASES ATARI GAMES

Broderbund Software has released its first two Atari games, Choplifter and Serpentine.

With Choplifter, the player uses realistic throttle action to manuever a daredevil rescue chopper, fighting off enemy jet fighters, air mines, tank fire and air-to-ground missles, in order to rescue hostages.

In Serpentine, giant serpents set forth to slay their slithery cousins in a fast arcade-style game with five maze configurations and many levels of play.

Choplifter sells for $44.95, and Serpentine lists for $39.95. For information contact Broderbund Software, Inc., 1938 Fourth St., San Rafael, CA 94901.

ELECTRONIC HOME ENTERTAINMENT SHOW

The second annual Electrical Home Entertainment Show is scheduled for April 6 to 10 in the Arlington Park Exposition Hall in Arlington Heights, IL.

Running concurrently with the Energy and Home Improvement Fair, the Electronic Home Entertainment Show will showcase personal computers, car audio systems, projection TV, VCRs, CB equipment, cable TV services and more.

For information contact Expo Management, Inc., The Apparel Center, Suite S2-132, Arcade, Chicago, IL 60654.

NEW MAGNOLIA SOFTWARE

Magnolia Microsystems has introduced several new software products, including the MMS-Net™ Local Area Network, the 4MHz Z80™ Co-processor and distribution of the CP/M-Plus™ operating system, for use with the Zenith Data System's 8-bit microcomputer.

MMS-Net provides a 4 MHz Z80 processor at each network node with communications via a connection that can use existing telephone-type wiring. Several thousand foot distances between stations are normal, and greater distances are possible with RF modems.

The Co-processor more than doubles the processing power of Zenith's series of small business computers.

In addition, Magnolia Microsystems has reached an agreement with Digital Research and is now able to distribute the CP/M-Plus operating system for use with the Zenith line.

For information contact Magnolia Microsystems, Inc., 2264-15th Ave. W., Seattle, WA 98119.

NEW CBS VIDEO GAMES

CBS Video Games has greatly expanded its product line to now include 14 new offerings.

Wings™ and Tunnel Runner™ both represent a new level of sophistication for ROM cartridge games. Wings is a flight simulation game, which puts the player in the cockpit of a jet fighter. Using radar to detect enemy missiles, the object is to protect the territory from enemy air attack.

Tunnel Runner is a three-dimensional perspective maze game that tests the player's ability to think logically while avoiding obvious hazards and monsters.

Because of CBS Video Games' licensing agreement with Bally/Midway it is also introducing Wizard of Wor™, Gorf™, Blueprint™ and Solar Fox™. The games involve one, two or more players and take game challengers to mystical kingdoms, the deep reaches of space, chasing evil blobs and finally into solar furnaces.

Other new game offerings include K-Razy Kritters™, K-Star Patrol™, K-Razy Antiks™ and K-Razy Shoot-out™. Each offers varying levels of play and entertaining challenges from missles to mazes.

The company is also releasing three additional games, Boulders and Bombs™, Mountain King™, and Time Trials™. Again, multiple levels of difficulty offer challenges for all players that will take them through tunneling adventures, mountain caverns and a timed road rally.

Finally, bridge players can learn the game with the expert—Charles Goren. Starting with a beginner's course and continuing through the advanced, the home computer program series helps develop strategy, tactics, psychology and partnership skills. In addition, games can be played with and against the computer.

NEW FROM AMDEK

Expanding or upgrading the computer is something every user finds himself thinking about from time to time. Amdek Corp. has introduced three new products for computer users to ponder over.

The first is a new 10-diskette package of microfloppy disks for use with the compact three inch Amdisk-III disk drive system. It is plug-in compatible with standard 5¼ inch drives.

Each micro-floppydisk provides up to 500 K byte storage capacity and features a hard plastic, "shirt pocket" size case with a protective hinged cover and "write protect" mechanism. A flip-type head cover protects the micro-floppydisk from dust, scratches or fingerprints.

Each diskette retails for $6.99, and the 10-package set is available for $49.

Also new from Amdek is an economical X-Y plotter, Model DXY Plotter, compatible with most personal computers. The plotter is designed for use by businesses, engineers and general computer users in giving their computer additional uses. It may be used to display data, charts, graphs, diagram and for other hard copy graphics.

Six new Amdek monitors with special interface cables are now available for use with most personal or small business computers. The monitors are models Video 300, Video 310, Color I, Color II, Color III and Color IV.

For information on any of these new products contact Amdek Corp., 2201 Lively Blvd., Elk Grove, IL 60007.

COMING IN THE MAY ISSUE OF TODAY

Interactive Gaming
An in-depth look at CompuServe's interactive games and the people who made it all possible.

Computer Game Creators
Meet some of the nation's top computer game creators in a series of fascinating personal profiles and interviews with Scott Adams, Dan Gorlin, Chris Jochumson, Silas Warner, Steve Bjork and others.

Sierra Series Review
A complete review of nine Sierra On-Line computer games including Marauder, Pest Patrol, Jawbreaker II, Lunar Leeper, Frogger, Crossfire and Ulysses and the Golden Fleece, Time Zone and Ultima II.

Computer Care
continued from pg. 29

strength" isolator and suppressor will give you a definite edge in comparison with the "cheapies."

For those with the money to spend, standby power supplies and uninterruptible power supplies are by far the best. Standby supplies are available in sizes from 200 watts to megawatts and at prices from $300 to many thousands. However, the average home or small-business user probably can get by with a 200-watt unit for a personal computer or something between 500 and 1,250 watts for a professional or business system. The advantage to these power supplies is that they provide automatic switch over to temporary battery backup power during an outage or severe low-voltage condition. Furthermore, they typically include surge suppression and noise filtration with the standby power.

True uninterruptible power supplies, known as UPS units, differ in that they power the computer equipment continuously from batteries and charge the batteries while the incoming line is active. When line power is interrupted, batteries continue to output without any switch-over. Like the standby units, these are available at many prices and in many sizes. However, a UPS unit of a given power rating typically costs more than a switching reserve supply of the same rating.

WEAR AND TEAR

Physical wear affects the moving parts in printers, disk drives, tape transports, keyboards, and switches. Since the component used most often wears the fastest, input-oriented systems likely will have the most trouble with the keyboards, while output-oriented systems will suffer on the printer end.

The effects are twofold, leading to either a gradual performance decline or an abrupt failure. In the first, the starts showing a few minor problems, but they quickly multiply. One key might not register every time, then another, and another. Disk input/output errors you saw once a month become weekly, then daily, then hourly. Printouts get fuzzy and indistinct, especially when compared with ones done months earlier.

Or, there can be a sudden failure without prior warning. A printer abruptly stops feeding ribbon or paper, a disk drive spins the disk but can't seem to access any data, a power switch may not work to turn the equipment on or off.

Preventive and remedial steps

The best protection, in fact the only protection, against wear is keeping the equipment clean, operating at design temperatures, and properly lubricated. There's no way to eliminate wear and stress on moving components, but you can minimize the effects.

Suitable lubrication is particularly important and must be provided in strict accordance with any schedules or procedures in equipment manuals. Failure to lubricate moving parts when and where necessary is a fast way to run up high repair bills, and mechanical parts are much more expensive to fix than electronic ones. On the other hand, excess lubrication isn't acceptable either, leaving residues that attract dirt, increase friction, and thereby cause even more wear. Watch out for parts that should not be lubricated, with special attention to the rails and components of the disk drives. Most maintenance manuals warn against lubricating the rails that support the read/write heads.

Be sure to use only those lubricants approved for the units or parts in question. There's no such thing as a universal oil, and one component like a letter-quality printer may need a dozen or more different lubricants. Of course, many high-grade lubricants are expensive, and stocking multiple types is costly. Even service shops and technicians usually don't often volunteer to clean and lubricate a machine.

Once wear- or stress-related failure does happen, there's little to do except replace the part or parts, or pay to have them replaced. However, you should be aware that it's hard to locate a good source of repairs on mechanical components. It seems almost any hack can manage to fix computer electronics just by hit or miss replacements until the problem goes away. But mechanical units like letter-quality printers take some training and skill to repair, often necessitating total machine realignment and adjustment for replacing a single small part. In fact, it's often necessary to send something like a printer back to the factory or a regional service depot to get the job done right.

RETROSPECT

In this article, I've tried to give you some insight into what's really involved in caring for a small computer. Regrettably, a magazine article doesn't afford space to cover a subject like this in the detail it deserves. Whole books can be written just on cleaning procedures, and those are just one aspect of the total picture.

The important thing is that you look for the obvious. Take care of dirt, excess heat, magnetic fields, static charges, power disturbances, and lubrication, and you've licked most of the problems. By doing some routine tasks, you can improve the odds in favor of a long, happy relationship with your computer system.

Ernest Mau is a free-lance writer from Denver

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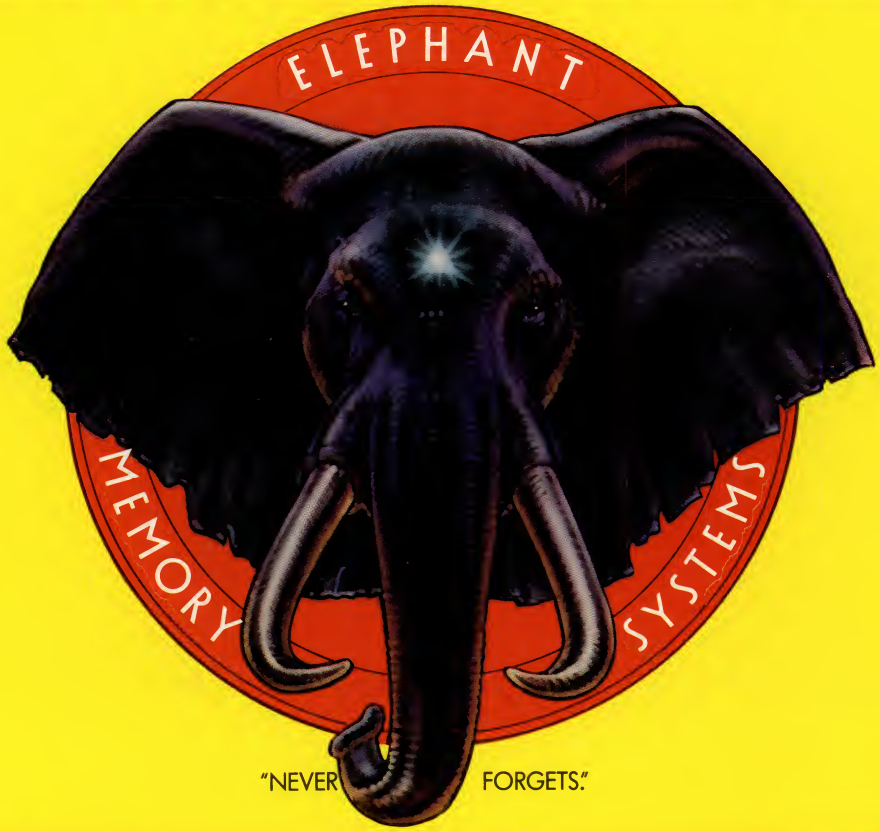

MORE THAN JUST ANOTHER PRETTY FACE.

Says who? Says ANSI.

Specifically, subcommittee X3B8 of the American National Standards Institute (ANSI) says so. The fact is all Elephant™ floppies meet or exceed the specs required to meet or exceed all their standards.

But just who is "subcommittee X3B8" to issue such pronouncements?

They're a group of people representing a large, well-balanced cross section of disciplines—from academia, government agencies, and the computer industry. People from places like IBM, Hewlett-Packard, 3M, Lawrence Livermore Labs, The U.S. Department of Defense, Honeywell and The Association of Computer Programmers and Analysts. In short, it's a bunch of high-caliber nitpickers whose mission, it seems, in order to make better disks for consumers, is also to make life miserable for everyone in the disk-making business.

How? By gathering together periodically (often, one suspects, under the full moon) to concoct more and more rules to increase the quality of flexible disks. Their most recent rule book runs over 20 single-spaced pages—listing, and insisting upon—hundreds upon hundreds of standards a disk must meet in order to be blessed by ANSI. (And thereby be taken seriously by people who take disks seriously.)

In fact, if you'd like a copy of this formidable document, for free, just let us know and we'll send you one. Because once you know what it takes to make an Elephant for ANSI . . .

We think you'll want us to make some Elephants for you.

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